FAO Fisheries Synopsis No. 125, Volume 12 FIR/S125 Vol. 12

FAO SPECIES CATALOGUE

VOL.12 NEMIPTERID FISHES OF THE WORLD

(Threadfin breams, Whiptail breams, Monocle breams, Dwarf monocle breams and Coral breams)

An Annotated and Illustrated Catalogue of Nemipterid Species Known to Date

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FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

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(Threadfin breams, Whiptail breams, Monocle breams, Dwarf monocle breams, and Coral breams) Family Nemipteridae

An Annotated and Illustrated Catalogue

of Nemipterid Species Known to Date

by

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PREPARATION OF THIS DOCUMENT

Nemipterid fishes (threadfin breams, whiptail breams, monocle breams, dwarf monocle breams and coral breams) are of significant interest to fisheries throughout the Indo-West Pacific region. Despite their economic importance, however, the classification of this group of fishes is confused, and because of difficulties with the correct identification of species, information on their biology and fisheries also is rather scanty.

The author of the present catalogue is undertaking a worldwide revision of the family Nemipteridae. This work is near completion, but final publication may take several more years. Because of their importance to fisheries, and to avoid undue delay to fishery workers who require this basic information for their daily work, taxonomic information to date on nemipterid fishes is presented here.

This catalogue is based on a comprehensive review of the literature; on the study of type specimens kept in the major museum collections throughout the world; and on extensive collection and examination of fresh material, particularly from the southeast Asian region.

In view of the importance of colour patterns as diagnostic characters for identification, colour plates for most species have been included.

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ABSTRACT

This is the twelfth issue in the FAO series of world-wide annotated and illustrated catalogues of major groups of organisms that enter marine fisheries. The present volume on the family Nemipteridae includes 62 species belonging to 5 genera. It comprises an introductory section with general remarks on the systematics, habitat and fisheries of the family, a glossary of technical terms used, illustrated keys to genera and species, and detailed accounts on all species. Species accounts include drawings, scientific and vernacular names, information on habitat, biology and fisheries, and a distribution map. Lists of nominal species in the family, a table of species by major marine fishing areas, and colour plates follow the species accounts. The work is fully indexed and there is comprehensive reference to pertinent literature.

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1. INTRODUCTION

This catalogue is intended as an identification guide to the threadfin breams (genus ***Nemipterus***), whiptail breams (genus ***Pentapodus***), monocle breams (genus ***Scolopsis***), dwarf monocle breams (genus ***Parascolopsis***) and coral breams (genus ***Scaevius***) of the world, primarily for use in fisheries and fisheries-related studies. Information useful for identification, as well as details on biology, ecology and catch statistics, where known, are presented for all of the 62 presently recognized species of nemipterid fishes, regardless of their importance to fisheries.

The nemipterids are one of the most important economic groups of marine fishes in the tropical Indo-West Pacific region, but they are also one of the most taxonomically difficult families to deal with. The group has been previously reviewed by Fowler (1931b, 1933), Weber & de Beaufort (1936) and Akazaki (1959, 1962), but there is little agreement in the nomenclature of these authors, and classification at the species level has been greatly confused. Recent reviews of the ***Nemipterus*** species of Thailand (Wongratana, 1972, 1974) and of the western Indian Ocean species of ***Nemipterus*** (Russell, 1986a), as well as re-examination of nemipterid type specimens in the Muséum National d'Histoire Naturelle, Paris, (Bauchot et al., 1983) have resolved some taxonomic problems. However, many species continue to be confused or incorrectly identified in the literature.

A major problem in resolving the taxonomy of the nemipterids is that many species are similar in morphology, and separation of taxa has been mainly on the basis of fresh coloration. Identification from preserved specimens often is difficult, and this has frequently led to misidentification. Except in the case of a few well-known species, much of our biological knowledge is tied to names which may not be correct, thus rendering the associated biological information of doubtful value. Other factors contributing to past confusion have been the failure of some taxonomists to re-examine type specimens, and also a lack of fresh material. In the course of the present work, the author has examined a wide range of museum specimens, including all extant types (the majority of which are in European museums), and has undertaken extensive field collecting of fresh specimens, mainly from fish markets throughout the Southeast Asian region. In some cases correct species determination was possible only by visiting the original type localities to obtain fresh material.

The taxonomic information provided in this catalogue is based on an on-going revision of the family Nemipteridae by the author. As such, the catalogue is not intended as a final, definitive work on the classification of the Nemipteridae, but rather as a state-of-the-art guide which summarizes taxonomic information to date, and which hopefully will serve as a foundation for further work.

Consistent with the format and style of the "FAO Species Catalogue" series, this catalogue is intended to be as self-contained as possible, and a glossary of technical terms and illustrations is provided to minimize the necessity to refer to related literature. Literature citations in the text have been kept to a minimum, and the literature that has been consulted is listed in the bibliography.

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Finally, I thank FAO staff for making the final editing session both successful and enjoyable.

1.1 Plan of the Catalogue

A family description is given, followed by a key to genera. The species accounts are arranged alphabetically by genera and species. Each genus is introduced with its type reference and synonyms. Descriptions of genera with more than one species also list diagnostic features and comments on general biology, habitat, distribution, and interest to fisheries. The genus descriptions are followed by a key to the species and species accounts in alphabetical order. The information pertaining to each species is arranged by paragraphs, in the order listed below:

(1) Scientific Name: The reference for the original description and type locality is given.

(2) Synonyms: All invalid names that have been applied are referenced.

(3) FAO Name: The FAO English name is considered the standard to be used by fishery purposes. This should avoid confusion which can be caused by the existence of multiple names for the same species or the same name for several species. The FAO name is not intended to supplant the use of local names but rather, to serve as a worldwide reference. FAO French and Spanish names are not yet available for most species.

(4) Diagnostic Features: Distinctive characters of the species are given as an aid for identification, accompanied by useful diagrams. These diagnoses should be consulted to confirm species identified using the illustrated key.

(5) Geographical Distribution: The general geographic range is given in the text and illustrated on a map. The map shading includes known areas of occurrence and intermediate areas between locality records where a species is expected to be found.

(6) Habitat and Biology: Information on habitat, behaviour, food habits and reproduction is given, where known.

(7) Size: Because many nemipterid fishes have filamentous extensions to the caudal fin, the usual measurement of size as total length can be misleading. For this reason, the measurement of size used throughout this catalogue is standard length (SL) (see Fig. 5). The approximate maximum size, and the size commonly attained are given throughout in SL.

(8) Interest to Fisheries: General information on the extent, type of fisheries, and utilization are given. Detailed fisheries data are unavailable for all species, and therefore only a qualitative assessment is usually possible.

(9) Local Names: These are given where published names are available. Often, a single local name is applied to several species.

(10) Literature: Only more recent references which contain illustrations that could be useful for identification are given. It is indicated if an incorrect name is given in the reference.

(11) Remarks: Useful information which is not appropriately covered in the previous paragraphs is included here. Frequently used incorrect scientific names are mentioned here.

1.2 General Remarks on Nemipterids

The Nemipteridae are marine perciformes that occur in the tropical-subtropical Indo-West Pacific. They belong to the superfamily Sparoidea, a monophyletic group that also contains the families Sparidae (porgies), Lethrinidae (emperor fishes and large eye breams - see FAO Species Catalogue, Vol. 9) and Centracanthidae (picarels).

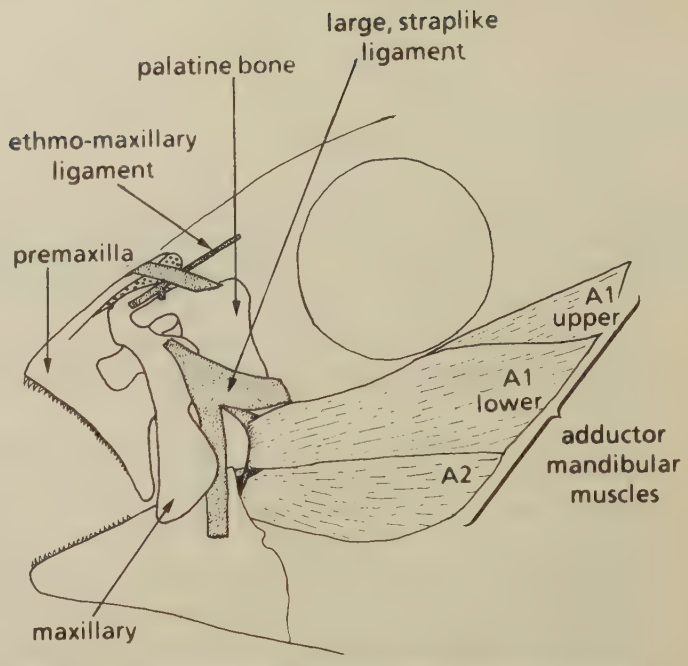


Fig. 1 Ligaments and muscles associated with jaw bones in ***Nemipterus*** (from Johnson, 1980)

Phylogenetic relationships and classification: The limits and relationships of the sparoid fishes have been discussed by Akazaki (1962) and Johnson (1980). Within the Sparoidea, the Nemipteridae are characterized by the presence of a well-developed, Y-shaped ethmo-maxillary ligament, with a branch inserting on the palatine (Fig. 1). In all other sparoids this ligament is reduced or absent. In addition, nemipterids have a large, strap-like ligament running forward from the ectopterygoid to insert by two separate branches on the maxillary and articular; the adductor mandibulae section A_1 is completely or partially divided into two separate sections, the lower of which lies lateral to A_2 (in contrast to lethrinids, in which A_1 lies medial to A_2); and the ramus mandibular passes lateral to A_2. Nemipterids also have a well-developed opisthotic (lost or fused in all other sparoids); an accessory subpelvic keel; a post pelvic process; and a subocular shelf. The posterior predorsal bone (predorsal configuration 0/0/2+1/1/) and the second epibranchial tooth plate also are lost in nemipterids.

The phylogenetic position of the Nemipteridae is still uncertain, but Johnson (1980) considers the nemipterids to be more closely related to the lethrinids than to other sparoids.

The Nemipteridae are recognized here as comprising five genera: ***Nemipterus***, ***Parascolopsis***, ***Pentapodus***, ***Scaevius***, and ***Scolopsis*** (Fig. 2). The taxonomic integrity of these genera has been widely accepted, although the validity of ***Parascolopsis*** has been challenged by some authors, who have included this genus within ***Scolopsis***. Preliminary osteological study, however, indicates a number of significant differences between ***Parascolopsis*** and ***Scolopsis***. These include differences in jaw structure, development of the infraorbital bones, number of epipleural ribs and degree of development of the second anal spine. In addition, species of ***Parascolopsis*** generally occur in deeper offshore waters and differ in habitat from ***Scolopsis***, which typically inhabit shallow reef areas. Pending further analysis of relationships, ***Parascolopsis*** and ***Scolopsis*** are therefore retained here as separate genera.

Taxonomic work on the Nemipteridae is still on-going. Among problems that remain to be resolved are the taxonomy of the species of the mainly deeper-water genus ***Parascolopsis***. Specimens of this group are comparatively rare in museums, and additional material is needed for identification of a number of apparently undescribed species which, because of their uncertain taxonomic status, are not included here. A revision of the genus ***Parascolopsis*** is planned, and separate papers revising the other nemipterid genera are presently being prepared. The reader is alerted particularly to forthcoming papers by the author in which the undescribed species of ***Nemipterus*** and ***Pentapodus*** included here, will be formally described and named.

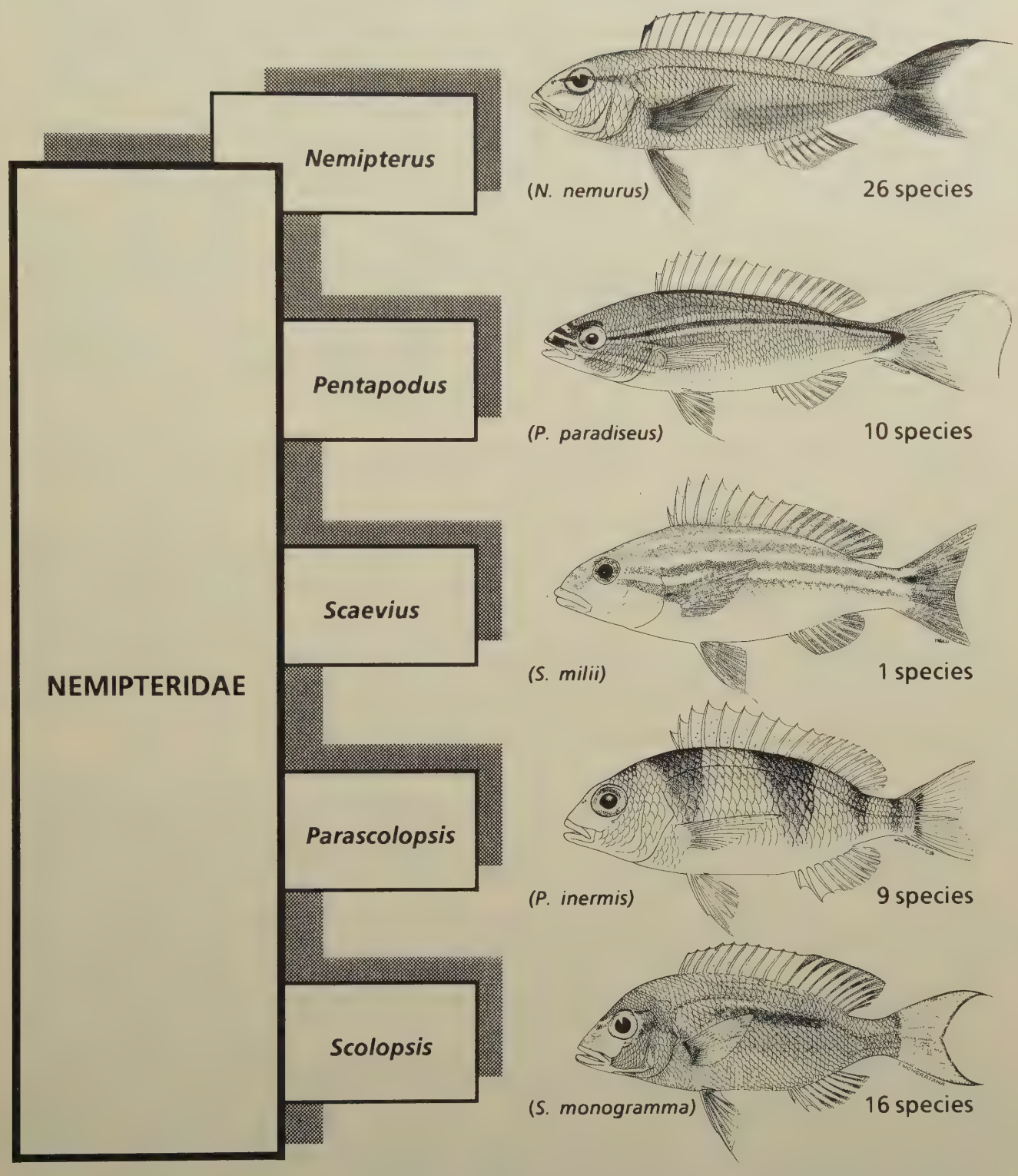


Fig. 2 A provisional classification of the genera of the Family Nemipteridae

Distribution, Habitat and Biology: The family Nemipteridae is confined to the tropical and subtropical Indo-West Pacific, and no species occur in the eastern Pacific, Atlantic (the type-locality of 'Surinam' for ***Dentex filamentosus*** Valenciennes [= ***Nemipterus nematophorus***] appears to be an error for Sumatra), or Mediterranean Sea (a report of ***N. japonicus*** as a Red Sea immigrant into the Mediterranean [Fischer & Whitehead, 1974] has yet to be confirmed). Three genera, ***Nemipterus, Scolopsis*** and ***Parascolopsis***, are distributed widely throughout the Indo-West Pacific region; the genus ***Pentapodus*** is restricted to the West Pacific (including north-western Australia and western Indonesia); and the monotypic genus ***Scaevius*** is endemic to northern Australia. Nemipterids are marine, bottom-living fishes (records of ***N. balinensoides*** and ***N. oveniides*** Popta [= ***N. peronii***] from 'Süsswasser' [fresh water] are very doubtful). Species of the genus ***Nemipterus*** occur on mud and sand bottoms in coastal inshore as well as offshore shelf waters and range in depth down to about 300 m, although most species occur in much shallower water. Species of the genus ***Parascolopsis*** occur on mud or sand bottoms mainly in offshore shelf waters in depths down to about 400 m. Species of the genus ***Pentapodus*** are benthic or free-swimming near the bottom, and usually occur on or close to coral reefs in depths down to 100 m. The monotypic ***Scaevius milii*** occurs on reef and shallow muddy or sand bottoms in inshore areas. Species of the genus ***Scolopsis*** occur usually on coral reefs, or on sand or mud bottoms close to reefs, in depths down to about 60 m. Nemipterids can be solitary or schooling and do not appear to be territorial.

Nemipterids are entirely carnivorous fishes and feed mainly on other small fishes, cephalopods, crustaceans, and polychaetes. Feeding in most species appears to be done during the day.

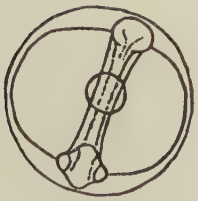
Many nemipterid fishes show size-related differences in sex ratios, with small fishes being mainly females and larger fishes males. In some species this size-related skew in sex ratios appears to be due to higher growth rates in males. However, histological examination of gonads indicates that protogynous hermaphroditism may also explain the size-related differences in sex ratios in some species. Protogynous hermaphroditism is reported for some species of ***Scolopsis***. There is evidence of hermaphroditism also in species of ***Pentapodus*** and ***Nemipterus*** (Young & Martin, 1985), although species of ***Nemipterus*** appear to be non-functional rudimentary hermaphrodites in which the males have functional testes, but retain rudimentary ovarian tissue throughout their life (Takahashi et al., 1989).

There are no reports of courtship or spawning behaviour among nemipterid fishes. Spawning seasonality varies widely among different species and appears to vary also between localities. Mature ova are present in species of ***Nemipterus*** over a prolonged period, inferring a protracted spawning season, with usually one or two periods of increased fecundity.

The eggs and newly-hatched larvae of ***N. virgatus*** (Fig. 3) have been described by Aoyama & Sotogaki (1955), Renzhai & Suifen (1980) and Renzhai (1986). Leis & Rennis (1983) have described and illustrated larvae of an unidentified nemipterid, probably ***Pentapodus*** (Fig. 4). Eggs of ***N. virgatus*** are colourless, buoyant and spherical, measuring 0.71 to 0.79 mm in diameter (Fig. 3 a-f). The yolk mass measures 0.58 to 0.60 mm in diameter, with an oil globule of 0.15 to 0.16 mm. Eggs take about 24 hours to hatch. The larvae hatch at 1.5 to 1.8 mm and newly hatched larvae have an elongate body, a small yolk sac, a single oil globule, unformed mouth, and unpigmented eyes (Fig.3 g). The lower finfold is transparent and only a few stellate melanophores are present along the ventral margin of the tail region. The body pigment changes during yolk absorption with branching melanophores appearing on the snout and front of the yolk mass. At 1.95 mm, the stellate melanophores along the ventral tail region are increased. By 7 mm spines are not yet present on the head and operculum but the stellate melanophores remain on the margin of the base of the anal fin and peduncle (Fig. 3 m). Distinguishing characteristics of nemipterid larvae include 22-24 myomeres, tightly coiled gut, large head lacking any spines, large eye, and ventral midline pigment (Fig. 4).

a) 8 hours, 35 min.

b) 16 hours, 50 min.

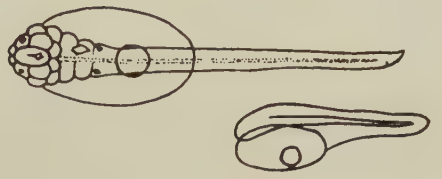


c) 20 hours, 10 min.

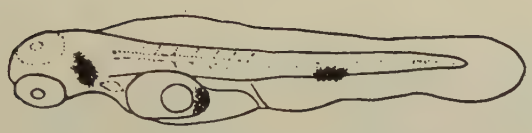
d) 20 hours, 30 min.

e) 26 hours

f) 27 hours



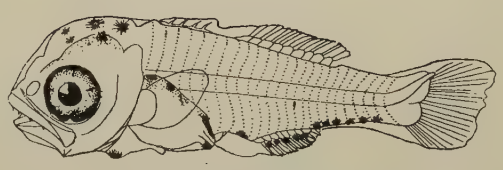
g) larvae just hatched, 1.7 mm TL



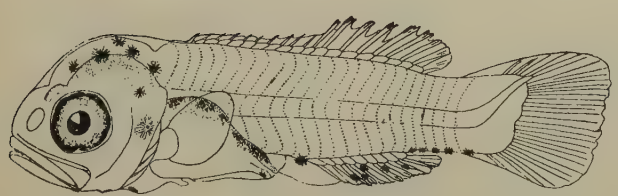
h) 24 hours after hatching, 2.3 mm TL

i) 48 hours after hatching, 2.5 mm TL

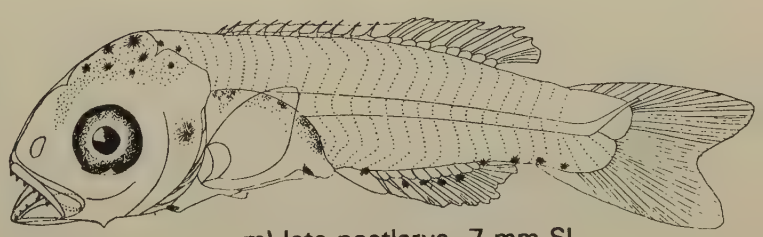
j) prelarva, 4.16 mm SL



k) prelarva, 4.6 mm SL



l) late postlarva, 5.9 mm SL



m) late postlarva, 7 mm SL

Fig. 3 Early development stages of ***Nemipterus virgatus***
(from Aoyama & Sotogaki, 1955: a to i; Renzhai, 1986: j to m)

Juveniles of ***Scolopsis*** species often are strikingly different in colour pattern to adults, and the juveniles of at least two species (***S. bilineatus*** and ***S. margaritifer***) appear to be Batesian mimics (Allen et al., 1975; Russell et al., 1976; Smith-Vaniz, 1976). The juvenile coloration of these scolopsids closely resembles poisonous or noxious blenniid species, and in the case of ***S. bilineatus*** this resemblance even extends to geographic subspecies of the blenniid (Russell et al., 1976).

Population dynamics of nemipterids have been studied only for species of ***Nemipterus*** and ***Scolopsis***, and the von Bertalanffy growth parameters, asymptotic length (L_∞) and the coefficient of growth (K) are known for populations of a few commercially important species (for details of growth parameters see individual species accounts).

Fisheries: Threadfin breams, and to a much lesser extent monocle breams, are an important component of commercial and artisanal fisheries of the Indo-West Pacific region. Whiptail breams are of artisanal fisheries importance in some areas and are also taken occasionally by recreational fishermen. Dwarf monocle breams, because of their usually small size and deeper-water habits are of little fisheries importance.

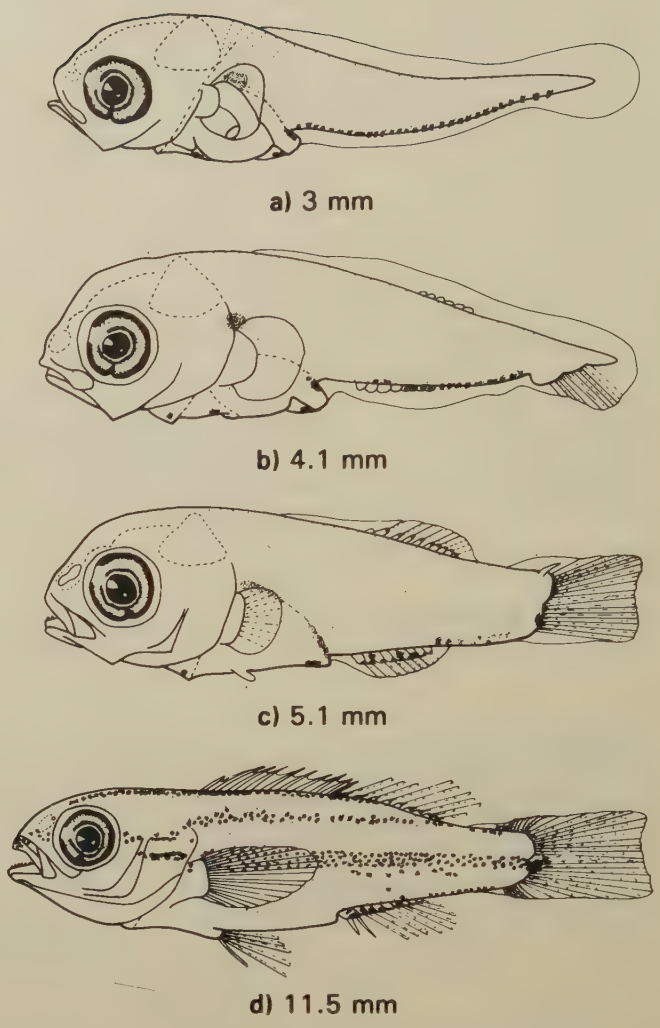


Fig. 4 Larvae of an unidentified nemipterid, possibly ***Pentapodus*** **sp.** (from Leis & Rennis, 1983)

Nemipterids are caught mainly by bottom trawl or by handline. Other methods include longline, gill nets, lift nets, surrounding nets, drive-in nets, fish stakes and traps. Some species of ***Scolopsis*** also are captured live by hand net for the aquarium trade. Nemipterids are popular eating fishes and are marketed fresh, dry-salted, dry-smoked, fermented and steamed. Trash fish are made into fish balls, fish cakes, fish meal and surimi, or used as animal feed.

Threadfin breams are usually taken in multispecies catches, and often three or more species of ***Nemipterus*** occur in the same trawl. Because of problems of identification, they are rarely reported as separate species, separate landing statistics are available only for one species (***Nemipterus virgatus***), while the remaining catch data are reported under unidentified ***Nemipterus*** species, ***Scolopsis*** species, or Nemipteridae (see Table 1). In many areas, species of ***Nemipterus*** are the second or third-most important catch species by weight. The total catch of nemipterids reported to FAO for 1987 amounted to 128 491 m. tons (FAO Yearbook of Fishery Statistics, Vol. 64, 1987). However, because of the largely artisanal nature of the fisheries of some areas and the paucity of landing statistics, the available figures probably grossly underestimate the actual catch of nemipterids taken in the Indo-West Pacific region.

Table 1

Reported Catch in Metric Tons of Nemipterids by Fishing Areas for 1987

	Fishing areas				
	51	57	61	71	Total
Nemipterus virgatus	-	-	6 220	-	6 200
Nemipterus spp.	906	10 086	23 232	86 175	120 400
Scolopsis spp.	-	521	-	353	874
Nemipteridae	997	-		-	997
Total	1 903	10 607	29 452	86 529	128 491

1.3 Illustrated Glossary of Technical Terms and Measurements

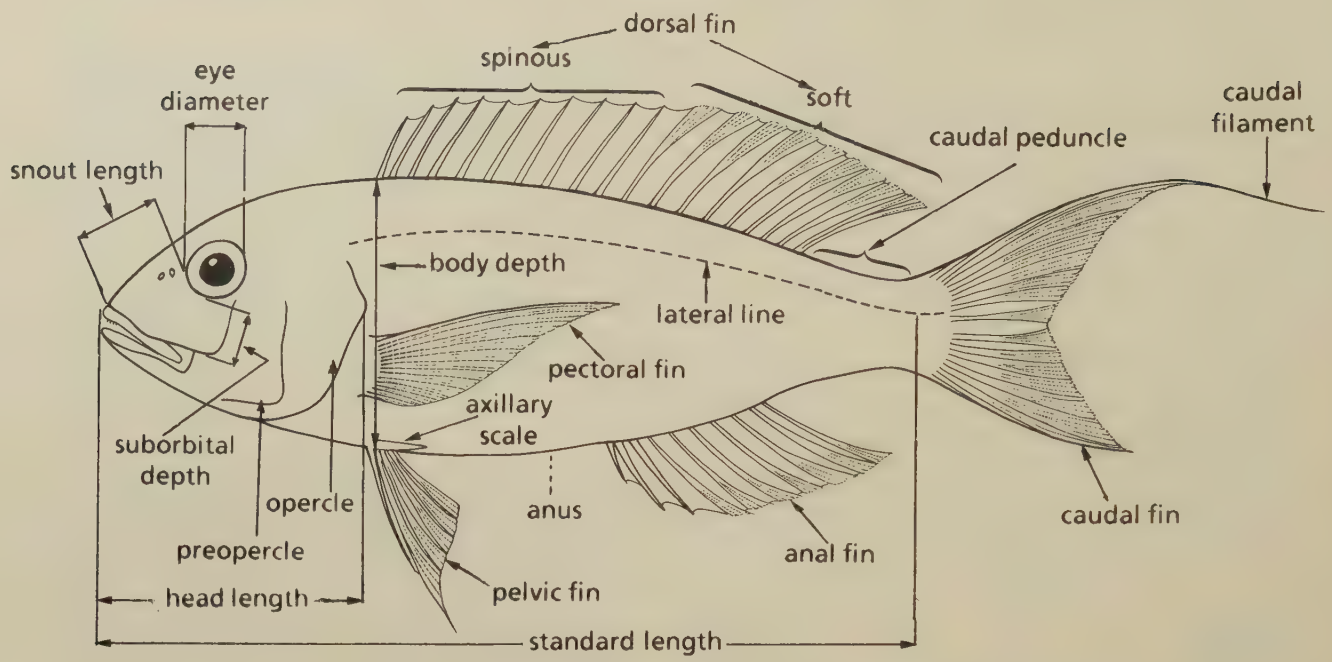


Fig. 5 External morphology and measurements

Anterior - Relating to the front portion.

Anus - The external opening of the intestine (Fig. 5).

Axillary scales - The pair of elongate, pointed, scales at the base of the pelvic fins (Fig. 5).

Bar - An elongate colour marking with vertical orientation, the sides of which are more or less straight.

Canine - A prominent elongate, curved, sharp tooth. In nemipterids, canines are usually restricted to the front part of the jaws (Fig. 6).

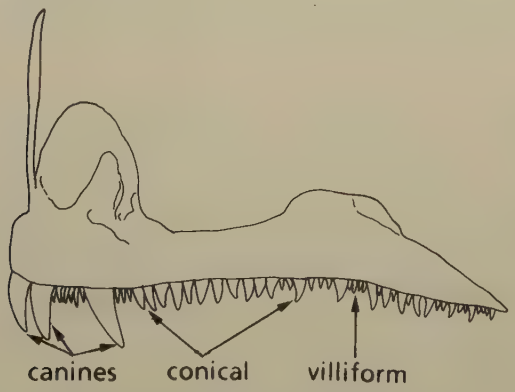


Fig. 6 Premaxilla of a nemipterid showing types of teeth

Caudal fin - The tail fin (Fig. 5).

Caudal peduncle - The narrow end of the body between the posterior basal ends of the dorsal and anal fins and the base of the caudal fin (Fig. 5)

Cheek, cheek scales - The area between the lower part of the eye and the lower limb of the preopercle. Species of the genus ***Nemipterus*** have 3 transverse rows of cheek scales, while other nemipterid species possess 4 to 6 transverse rows of scales (Fig. 7).

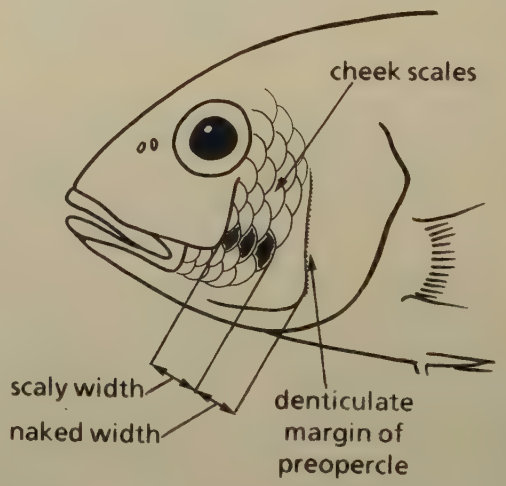


Fig. 7 Cheek scales and preopercle measurements

Compressed - Flattened from side to side; refers to relative body width.

Conical - Cone-shaped; refers to teeth (Fig. 6).

Continuous - In actual contact or closely adjoining.

Dentary - The lower jaw bone.

Denticulate - Having the appearance of teeth or teeth-like structures (Fig. 7)

Dorsal - Toward the back or upper part of the body.

Dorsal fin - A median fin along the back. In nemipterids, the fin is supported by spinous rays anteriorly and soft rays posteriorly (Fig. 5).

Dorsal profile - Refers to the upper edge of the body in lateral view.

Dorsal midline - The longitudinal axis along the dorsal surface of the body.

Elongate - Extended; drawn out.

Emarginate - With the margin slightly hollowed, concave; used to describe the shape of the posterior margin of the caudal fin (Fig. 8).

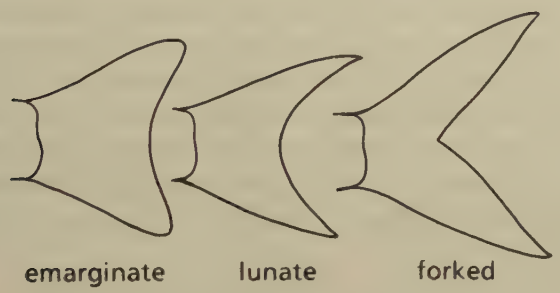


Fig. 8 Types of caudal fins

Falcate - Scythe-like; long, narrow and curved; used to describe the shape usually of the upper lobe of the caudal fin (Fig. 9).

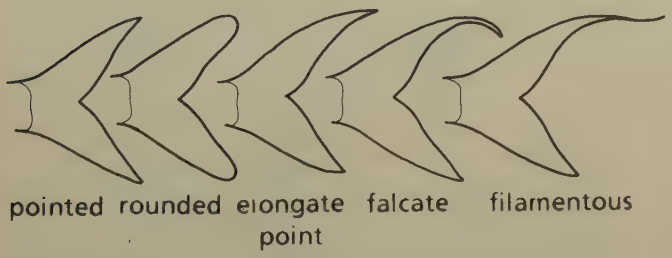


Fig. 9 Shapes of upper caudal fin lobe

Filament, filamentous - Used to describe the elongation of the anterior rays of the dorsal fin or the upper and/or lower lobe of the caudal fin (Fig. 9).

Forked - Used to describe a caudal fin shape with angular lobes (Fig. 8).

Gills, gill rakers - Bony arches, covered by the operculum, which bear the gill filaments posteriorly and the gill rakers anteriorly. In nemipterids, the gill rakers are short and sparsely covered with tiny spines. Gill raker counts are made on the first arch and include small rudiments.

Interobital width - The least distance between the orbits (Fig. 10).

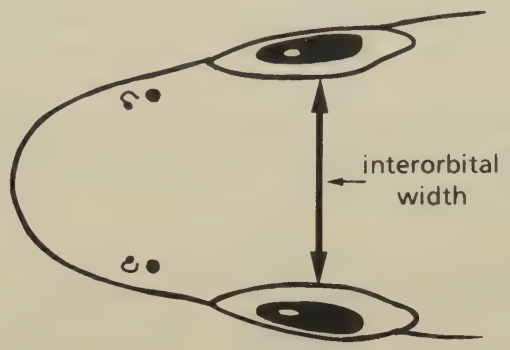


Fig. 10 Top of head

Isthmus - The area of the ventral surface where the gill membranes meet.

Lateral - At or towards the side.

Lateral line - A series of pored or tubed scales forming a line along the side of the body (Fig. 5). The lateral-line scales are counted from the most anterior pored scale near the upper end of the operculum to the base of the caudal fin which is detected by the crease which results from folding the fin forward.

Lunate - Shaped like a crescent moon; used to describe the shape of the caudal fin Fig. 8).

Maxilla, maxillary - The bone of the upper jaw lying above the premaxilla (Fig. 11). The outside surface of the maxilla in nemipterids can be either relatively smooth (Fig. 11a), or have a denticulate ridge (Fig. 11b).

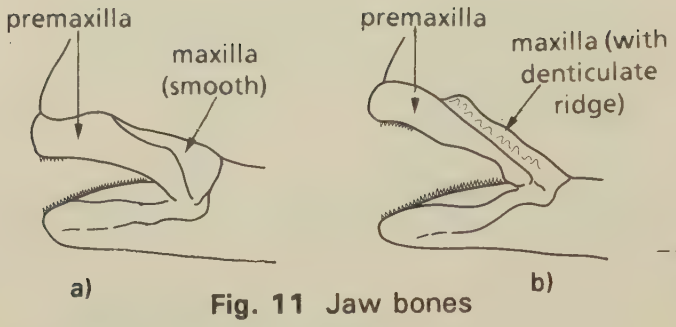


Fig. 11 Jaw bones

Median - Pertaining to the middle.

Meristic - Divided into parts or discrete units; pertaining to the number of parts as in scales or fin rays. Meristic characters include scale counts and fin ray counts.

Midlateral - The longitudinal axis along the side of the body.

Naked - Without scales.

Nomen nudum - A species name proposed without any acceptable description and having no taxonomic validity.

Opercle, operculum - The large bone forming the upper posterior of the gill cover (Fig. 5).

Pectoral fins - The anterior or uppermost of the paired fins (Fig. 5).

Pelvic fins - Paired fins behind or below the pectoral fins (Fig. 5).

Posterior - The rear or hind portion.

Position of eye relative to a line drawn from tip of snout to upper base of pectoral fin - The lower margin of the eye may be below (Fig. 12a), tangent to (Fig. 12b) or above (Fig. 12c) a line drawn from the tip of the snout to the upper base of the pectoral fin.

Premaxilla, premaxillary - The anterior bone of the upper jaw (Fig. 11).

Preopercle - Bone on cheek in front of opercle and forming front of gill cover (Fig. 5).

Rays - The rigid structures that support the fin; spinous rays are stiff, unsegmented, and support the anterior portion of the dorsal and anal fin; soft rays are segmented, and flexible and support the posterior portion of the dorsal and anal fin in nemipterids (Fig. 5).

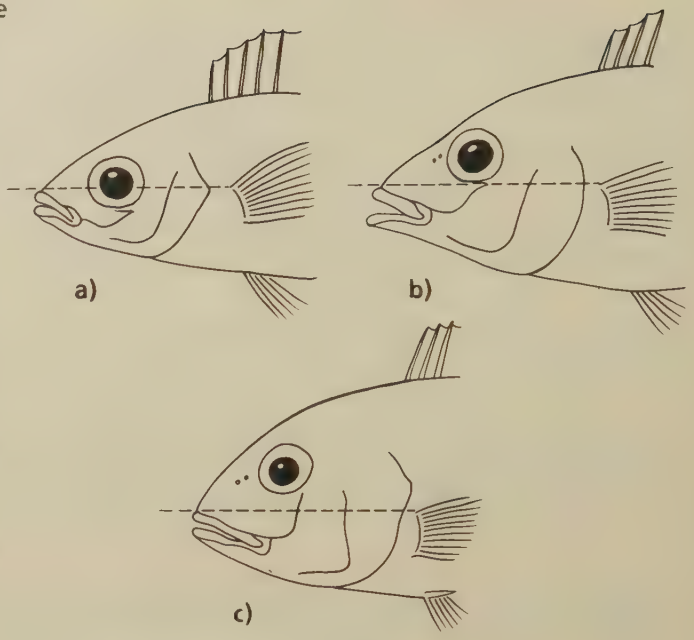


Fig. 12 Position of eye relative to a line between tip of snout to upper pectoral fin base

Scales above and below lateral line - A transverse series of scale rows; scales below the lateral line are counted from the origin of the anal fin, not including the median scale row, along a forward diagonal to the lateral line, but not including the lateral-line scale; scales above the lateral line are counted from the origin of the spinous portion of the dorsal fin, including the row of small scales at the base of the dorsal fin (this is usually listed as half a scale), on a diagonal backward to the lateral line, and not including the lateral-line row (Fig. 13).

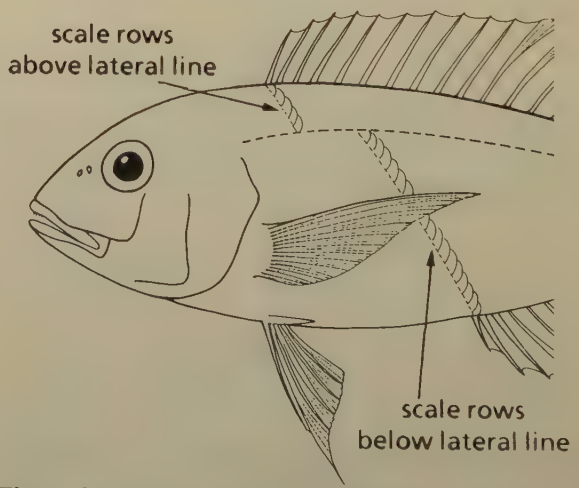


Fig. 13 Scale counts above and below lateral line

Snout - The area between the tip of the upper lip and the anterior margin of the eye. In nemipterids the snout is measured without the lip (Fig. 5).

Soft dorsal - The posterior part of the dorsal fin which is composed of jointed or soft rays.

Spinous dorsal - The anterior part of the dorsal fin supported by spines.

Spot - A more or less circular colour marking.

Standard length - The straight line distance from the tip of the snout, excluding the upper lip, to a vertical line passing through the base of the caudal fin (taken to be the point of flexure of the caudal fin) (Fig. 5).

Stripe - An elongate colour marking with a horizontal or length wise orientation, the sides of which are more or less straight.

Suborbital, suborbital width - The bone beneath the eye. In nemipterids this bone has a free posterior margin that is smooth, denticulate or bears one or more spines (see Fig. 20). Its lower margin is straight or emarginate. It may be scaly or naked. A line drawn up from the posterior margin may reach the dorsal profile before, at or behind the origin of the dorsal fin (Fig. 14). The suborbital depth is the distance between the anterior edge of preorbital bone (can be felt at about mid-point of upper jaw, behind lip) to the lower edge of orbit (Fig. 5).

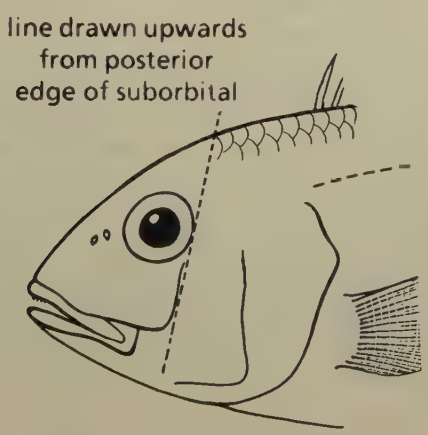


Fig. 14 Slope of posterior margin of suborbital bone

Synonym - One or more scientific names used to denote the same taxon. The first established scientific name is usually that which is the accepted name; all other later established names are junior synonyms.

Transverse - Crosswise.

Undulated - Waved.

Uniform - As applied to coloration, of one colour.

Ventral - Pertaining to the abdomen or lower surface

Ventral midline - The longitudinal axis along the ventral surface of the body

Vertical fins - Fins on the median line of the body; the dorsal, anal and caudal fins.

Villiform - Small, close-set teeth, usually in bands.

2. SYSTEMATIC CATALOGUE

2.1 Diagnostic Features of the Family Nemipteridae

Sparoid fishes of shallow to moderately deep shelf waters of the tropical and subtropical Indo-West Pacific. Body elongate to moderately deep, compressed. A single continuous dorsal fin, with 10 spines and 9 soft rays (last ray branched at base); anal fin with 3 spines and 7 (except ***Nemipterus virgatus*** with 8) soft rays (last ray branched at base); pectoral fin with 2 unbranched and 12 to 17 branched rays; pelvic fin thoracic, with 1 spine and 5 soft rays; caudal fin emarginate, forked, lunate or falcate; the upper and/or lower tips of the fin with or without pointed or filamentous extensions; scales finely ctenoid and moderate in size. Mouth terminal, small to moderate; premaxillaries moderately protrusible, the ascending process never as long as the alveolar ramus; articular process not fused to ascending process along anterior margin; post maxillary process present, low, broad-based; palato-premaxillary ligament well-developed; ethmo-maxillary ligament well-developed, Y-shaped, with a ventrolateral branch inserting on the palatine anterior to the insertion of the palato-premaxillary ligament; teeth in jaws conical, enlarged canines present anteriorly in ***Nemipterus*** and ***Pentapodus***; vomer and palatine toothless. Gill membranes free from the isthmus; gill arches 4, a slit behind the fourth; pseudobranch well-developed; gill rakers short, knob-like; 6 branchiostegal rays, the first 5 inserting on the ceratohyal, the sixth inserting at the interspace between the ceratohyal and the epihyal; second and third epibranchial tooth plates lacking. First and second infraorbitals deep; the third infraorbital never deep, and the second infraorbital typically projecting backward below it (this posterior projection developed as an externally visible spine in ***Scolopsis***); third infraorbital with a well-developed subocular shelf; fourth infraorbital often with a very small shelf. Two predorsal bones present in the following configuration: first predorsal, first neural spine, second predorsal, second neural spine, first pterygiophore supporting the first 2 dorsal spines plus the second pterygiophore supporting the third dorsal spine, third neural spine, third pterygiophore supporting the fourth dorsal spine, fourth neural spine; the last pterygiophore of the dorsal and anal fins trisegmental. Epipleural ribs 8 to 12; accessory subpelvic keel and post pelvic process present; opisthotic well-developed.

2.2 Notes on the Identification of Nemipterids

Because of similarities in the morphology of many nemipterid species, correct identification often is difficult, particularly when dealing with preserved specimens. The species of this family are most easily identified on the basis of their live or fresh colours, but unfortunately these colour patterns do not preserve well. Meristic characters, such as fin ray counts and scale counts, are relatively constant among nemipterids and are of only limited use in separating species. Likewise, because of similarities in body shape, as well as allometric growth, there is considerable morphometric overlap between species, and proportional measurements often do not reliably distinguish similar species. The keys provided in this catalogue are based as much as possible on simple morphological and meristic characters, or a combination of characters that serve to differentiate both preserved and fresh specimens. In a few cases, attempts to differentiate species on the basis of morphology have proved unsuccessful, and fresh colours provide the only reliable means of separating these species. To confirm species identifications using the keys, the individual species diagnoses and illustrations should also be consulted.

2.3 Illustrated Key to Genera

1a. Suborbital scaly or naked, spine weak or absent; posterior margin of suborbital smooth, finely serrate, or with a few small denticulations; posterior margin of preopercle finely denticulate or smooth; canine teeth in jaws absent, or present only anteriorly

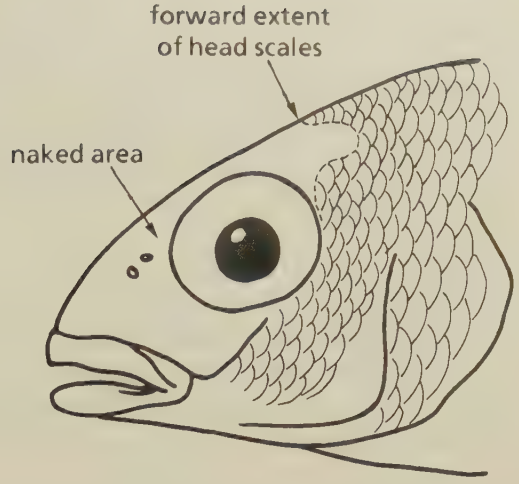
2a. Scales on top of head not reaching to level of eyes; temporal parts of head naked (Fig. 15) . . . . . ***Scaevius*** (***milii***)

2b. Scales on top of head reaching forward to or in front of middle of eyes; temporal parts of head scaled (Figs 16, 17)

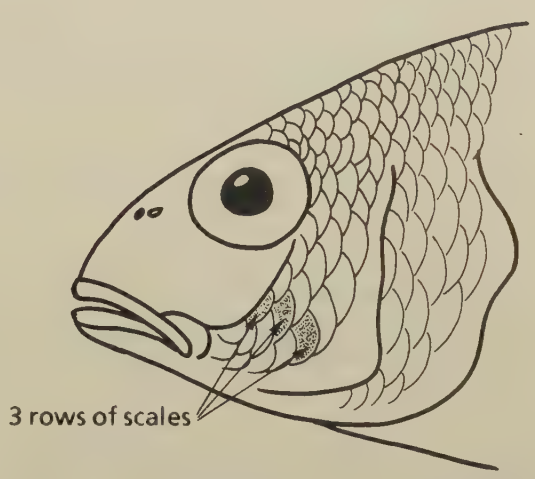
3a. Suborbital spine absent; 3 transverse scale rows on preopercle (Fig. 16) . . . . . ***Nemipterus***

3b. Suborbital spine weak or absent; 4-6 transverse scale rows on preopercle (Fig. 17)

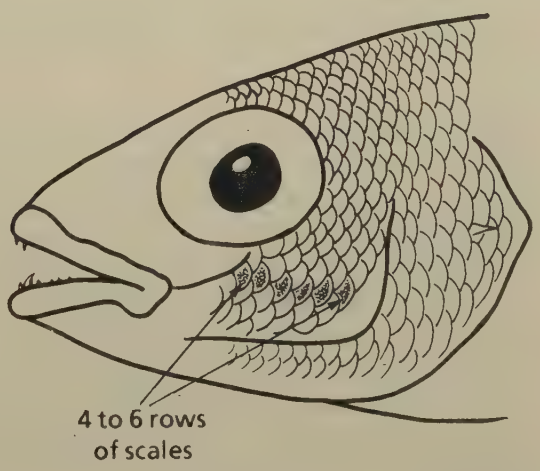
4a. Body depth 3.0-3.5 in SL; 2 or 3 pair of small canines anteriorly in upper jaw, a single pair of larger, flared canines anteriorly on either side of lower jaw (Fig. 18); second anal spine shorter and less robust than third (Fig. 19a) . . . ***Pentapodus***



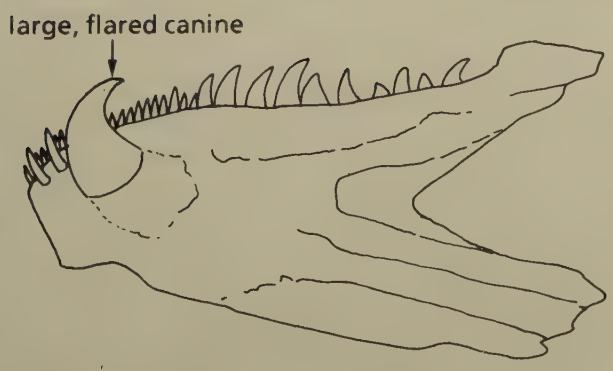
Scaevius milii **Fig. 15**



Nemipterus **Fig. 16**

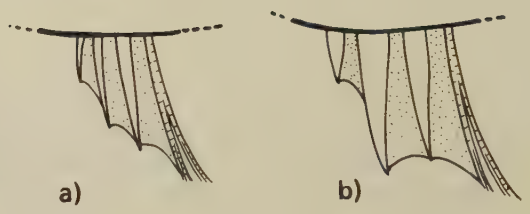


Pentapodus **Fig. 17**



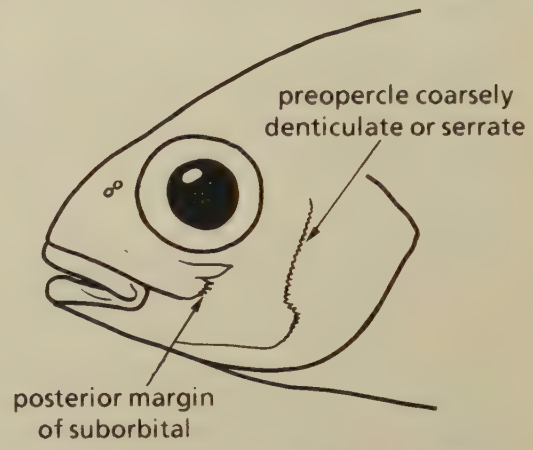
lower jaw (dentary) of *Pentapodus* **Fig. 18**

4b. Body depth 2.5-3.0 in SL; canine teeth in jaws absent; second anal spine usually longer and more robust than third spine (Fig. 19b) . . . . . ***Parascolopsis***



anal fin spines **Fig. 19**

1b. Suborbital naked, with a large backwardly pointing spine and a series of smaller spines or serrations on its posterior margin (Fig. 20); posterior margin of preopercle coarsely denticulate or serrate (Fig. 20); canine teeth absent ***Scolopsis***



Scolopsis **Fig. 20**

2.4 Information by Species

Nemipterus Swainson, 1839	**NEMIP Nem**

Genus: ***Nemipterus*** Swainson, 1839, Nat. hist. fishes, 2: 223. Type species, ***Dentex filamentosus*** Valenciennes in C. & V. (1830b), by original designation.

Synonyms: Genus ***Spondyliosoma*** Cantor, 1850; Genus **Synagris** Günther, 1859; Subgenus ***Anemura*** Fowler, 1904; Subgenus ***Odontoglyphis*** Fowler, 1904; Subgenus ***Euthyopteroma*** Fowler, 1904.

Diagnostic Features: Small to medium-sized fish with a slender or moderately deep, laterally compressed body. Teeth small and conical or villiform, in tapering bands in both jaws; small pointed or recurved canine teeth anteriorly in the upper and lower jaw present in some species. Gill rakers short and stubby, 10 to 20 on first arch. A single dorsal fin with 10 spines and 9 soft rays (last ray branched at base); pectoral fins short to moderately long, with 2 unbranched and 13 to 16 branched rays; pelvic fins short or long, with 1 spine and 5 soft rays; anal fin with 3 spines and 7 or 8 soft rays (last ray branched at base); caudal fin forked; upper lobe of caudal fin rounded, pointed, falcate, or produced to form a short or very long trailing filamentous extension. Body covered with ctenoid scales, scales on top of head reaching forward to level of middle of eyes; suborbital naked, its posterior margin smooth; preopercle scaly, with 3 transverse scale rows, lower limb of preopercle naked; posterior margin of preopercle finely denticulate or smooth; opercle scaly; upper margin of opercle with a small, flat embedded spine. Lateral-line scales 45 to 51; 3½ to 4½ transverse scale rows above lateral line, 9 to 12½ rows below. **Colour:** extremely variable, but usually pinkish or silvery, with red, yellow and blue markings.

Biology, Habitat and Distribution: Benthic, inhabits marine waters, on sandy or muddy bottoms, usually in depths of 20 to 50 m, but some species occur down to 300 m; solitary or in large aggregations. ***Nemipterus*** species feed principally on small benthic invertebrates (polychaetes, crustaceans, cephalopods, molluscs) and small fishes. Males are usually larger and some species may be protogynous hermaphrodites.

Geographical Distribution: Indo-West Pacific region in tropical and subtropical coastal waters.

Interest to Fisheries: Important in fisheries, species of the genus ***Nemipterus*** are among the most important catch by weight throughout the Indo-West Pacific region. Catches of ***Nemipterus*** are usually not identified to species and separate catch statistics are available only for ***N. virgatus*** (see Table 1). The total reported catches of unclassified ***Nemipterus*** for 1987 was 120 000 m tons, with greatest catches being landed in the Philippines, Thailand, Hong Kong, Malaysia, Indonesia and Taiwan.

Nemipterus are caught most commonly using otter or pair trawls. Other commercial and artisanal gear includes seine net, gill net, longline, handline, fish stakes and traps, lift nets, surrounding nets, drive-in nets.

Nemipterus species are marketed mainly fresh; also salted and dried, dry-smoked, fermented, and steamed. Trash fish are made into fish balls and cakes, fish meal and surimi, or used as animal feed.

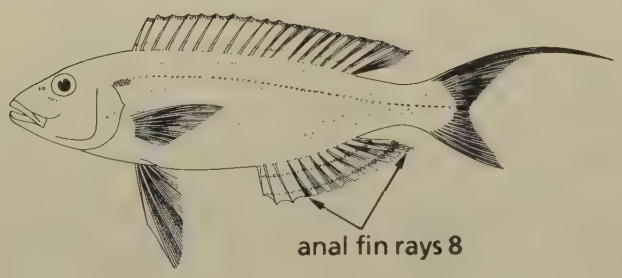
Literature: Fowler (1931b); Weber & de Beaufort (1936); Akazaki (1962); Wongratana (1972, 1974); Bauchot et al. (1983); Russell (1986a).

Remarks: The original designation of the type species for the genus ***Nemipterus***, ***Dentex filamentosus*** Valenciennes in C. & V. (1830b), is preoccupied by ***Cantharus filamentosus*** Rüppell (= ***N. japonicus***). ***N. nematophorus*** (Bleeker) is the valid name for the species described by Valenciennes.

Key to the species of *Nemipterus*

1a. Anal fin with 3 spines and 8 rays (W. Pacific) . . . . . ***N. virgatus*** (Fig. 21, Plate III, g)

1b. Anal fin with 3 spines and 7 rays



N. virgatus **Fig. 21**

2a. First two dorsal spines close together, almost fused, produced to form a very long filament (Fig. 22) (E. Indian Ocean and W. Pacific from S. China Sea to Indonesia) . . . . . ***N. nematophorus*** (Fig. 22, Plate II, e)

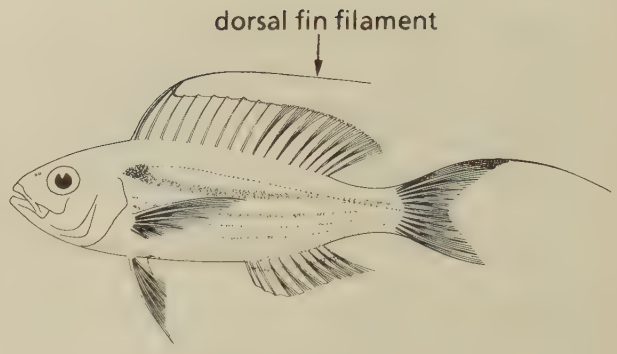
2b. First two dorsal spines separated by a membrane, not produced into a long filament, and shorter than the following spines

3a. Membrane between dorsal spines deeply incised (Fig. 23) (Indo-W. Pacific) . . . . . ***N. peronii*** (Fig. 23, Plate II, h)

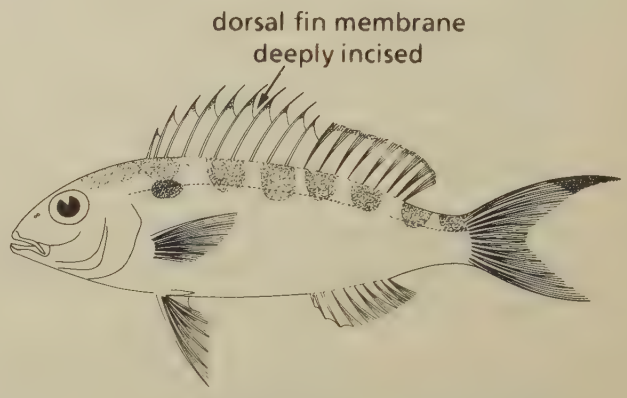
3b. Membrane between dorsal spines continuous or only slightly emarginate (Fig. 24)

4a. Upper lobe of caudal fin produced to an elongate point (Fig. 25a), falcate (Fig. 25b), or extended into a narrow filament (Fig. 25c)

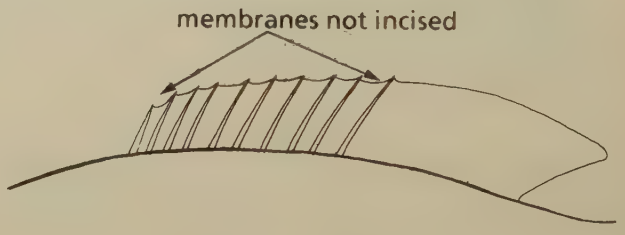
5a. Upper lobe of caudal fin produced to an elongate point (Fig. 25a); dorsal fin elevated, first dorsal spine long, 1.1 to 1.4 in length of longest dorsal spine



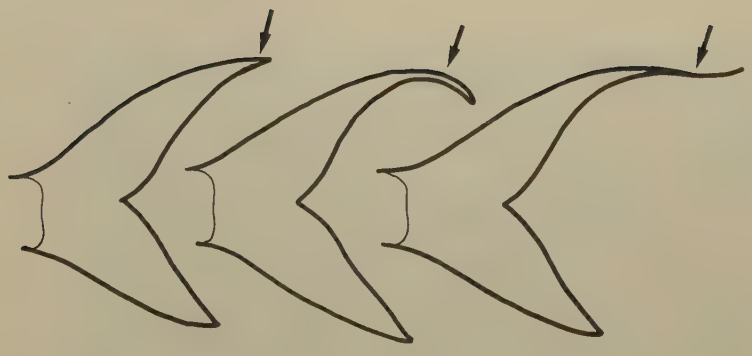
N. nematophorus **Fig. 22**



N. peronii **Fig. 23**



dorsal fin **Fig. 24**



a) elongate point **b)** falcate **c)** filamentous

shapes of upper caudal fin lobe **Fig. 25**

6a. Pelvic fins reaching to or beyond level of origin of anal fin; pectoral fins reaching to or just beyond level of anus, 1.1 to 1.3 in head length; gill rakers 11 to 13; 5 pale golden stripes on sides beneath the lateral line; anal fin with a narrow golden stripe just above its base, this stripe extending out to tip of the last soft ray (Indonesia) . . . . . ***N.* sp.1**
(Fig. 26, Plate III, b)

Nemipterus sp. 1 **Fig. 26**

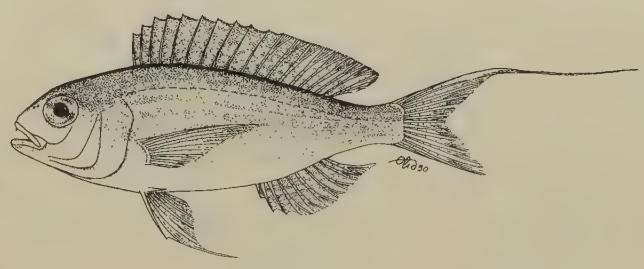
6b. Pelvic fins reaching to or short of level of origin of anal fin; pectoral fins reaching to or just short of level of origin of anal fin, 0.9 to 1.1 in head length; gill rakers 13 to 16; 2 narrow golden stripes on sides beneath the lateral line; anal fin without stripes (W. Pacific from S. Japan to Indonesia) . . . . . ***N.* sp. 2**
(Fig. 27, Plate III, c)

Nemiptrus sp. 2 **Fig. 27**

5b. Upper lobe of caudal fin falcate (Fig. 25b) or extended into a short or long filament (Fig. 25c); dorsal fin not notably elevated, first dorsal spine short, 1.3 to 2.9 in length of longest spine

7a. Pelvic fins very long, reaching to or beyond level of origin of anal fin

8a. Pectoral fins very long, reaching to or beyond level of origin of anal fin; caudal filament long (W. Indian Ocean) . . . . . ***N. randalli***
(Fig. 28, Plate III, a)



N. randalli **Fig. 28**

8b. Pectoral fins moderately long, reaching to beyond level of anus, but short of level of origin of anal fin; caudal filament short (W. Pacific) . . . ***N. marginatus***
(Fig. 29, Plate II, c)

N. marginatus **Fig. 29**

7b. Pelvic fins short or moderately long, not reaching to level of origin of anal

9a. Pectoral fins very long, reaching to or beyond level of origin of anal fin (Indo-W. Pacific) . . . . . ***N. japonicus*** (Fig. 30, Plate II, b)

N. japonicus **Fig. 30**

9b. Pectoral fins short or moderately long, not reaching to level of origin of anal fin

10a. A line drawn upwards from posterior edge of the sub-orbital reaching the dorsal profile at or behind origin of dorsal fin; gill rakers 14 to 20 (N.E. Australia) . . . . . ***N. aurifilum*** (Fig. 31)

N. aurifilum **Fig. 31**

10b. A line drawn upwards from posterior edge of the sub-orbital reaching the dorsal profile before origin of dorsal fin; gill rakers 10 to 16

11a. Body elongate, depth 3.8 to 4.6 in SL (Indo-W. Pacific) . . . . . ***N. zysron*** (Fig. 32, Plate IV, a)

11b. Body moderately deep, depth 2.9 to 4.0 in SL

N. zysron **Fig. 32**

12a. Eye tangent to or below a line from tip of snout to upper base of pectoral fin

13a. Upper lobe of caudal fin falcate, ribbon-like, uniformly yellow; body depth 3.2 to 4.0 in SL; sides of body with two yellow stripes, the lower stripe originating behind base of pectoral fin; dorsal fin with undulating yellow lines (W. Pacific) . . . . ***N. bathybius*** (Fig. 33, Plate I, c)

N. bathybius **Fig. 33**

13b. Upper lobe of caudal fin filamentous, yellow with red lower margin; body depth 2.9 to 3.6 in SL; sides of body with two yellow stripes, the lower stripe originating above upper base of pectoral fin; dorsal fin without undulating yellow lines (Indonesia)***N. balinensis*** (Fig. 34, Plate I, a)

N. balinensis **Fig. 34**

12b. Eye tangent to or above a line from tip of snout to upper base of pectoral fin

14a. Pectoral-fin rays ii, 14; pectoral and pelvic fins reaching to or just short of level of anus; sides of body with two yellow stripes; red spot between first two dorsal spines (W. Pacific) . . ***N. nemurus*** (Fig. 35, Plate II, g)

N. nemurus **Fig. 35**

14b. Pectoral-fin rays ii, 14 to 16 (usually ii, 15 or 16); pectoral and pelvic fins reaching to or beyond level of anus; sides of body with indistinct midlateral yellow stripe; red spot between first two dorsal spines absent (Fiji, Vanuatu) . . . . . ***N. vitiensis*** (Fig. 36, Plate III, h)

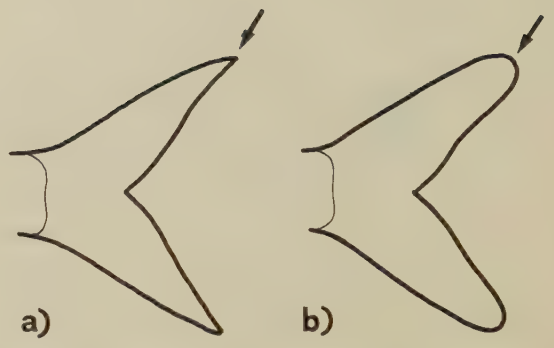
N. vitiensis **Fig. 36**

4b. Upper lobe of caudal fin pointed (Fig. 37a) or rounded (Fig. 37b), not produced

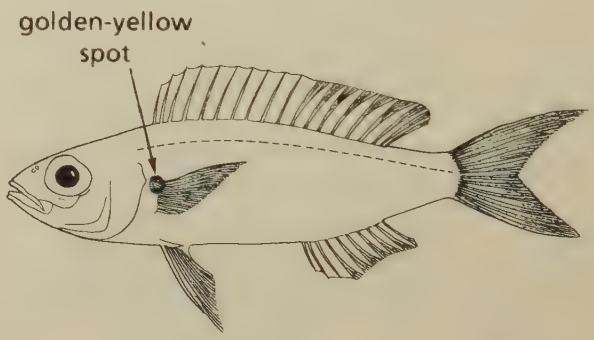
15a. Lower margin of eye below a line drawn from tip of snout to upper base of pectoral fin; suborbital narrow, 3.6 to 6.7 in eye diameter; golden-yellow spot, edged with red above and below, above upper base of pectoral fin (Indonesia) . . . . ***N. balinensoides*** (Fig. 38, Plate I, b)

15b. Lower margin of eye tangent to or above a line drawn from tip of snout to upper base of pectoral fin; suborbital deeper, 0.9 to 2.8 in eye diameter; no yellow spot above base of pectoral fin

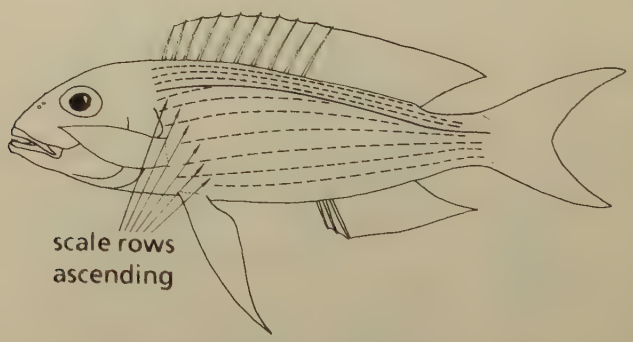
16a. Scales below lateral line in ascending rows anteriorly (Fig. 39)



shape of upper caual fin lobe **Fig. 37**



N. balinensoides **Fig. 38**



longitudinal scale rows **Fig. 39**

17a. Upper lobe of caudal fin pointed, tip black (pigment retained in preserved specimens) (E. Australia) . . . . . ***N. theodorei***
(Fig. 40, Plate III, f)

17b. Upper lobe of caudal fin rounded or slightly rounded, tip pink or same colour as rest of fin

18a. Dorsal fin with one or more distinctive stripes

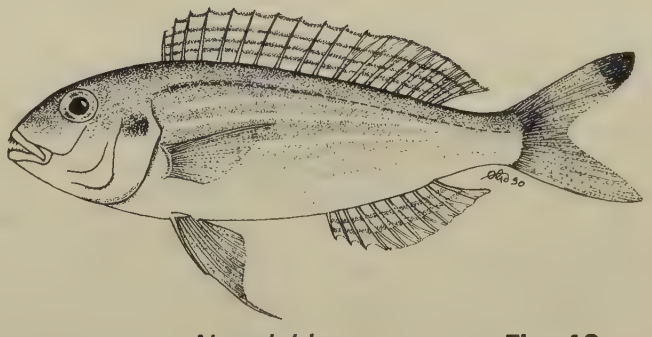
19a. Dorsal fin pale yellow, with a broad, bicoloured submedial stripe (yellow above, orange below), yellow margin and pale mauve submarginal stripe; anal fin with a single, pale lemon submedial stripe (sometimes broken) (W. Pacific) . . . . . ***N.* sp. 3**
(Fig. 41, Plate III, d)

19b. Dorsal fin translucent pink, with 2 or 3 narrow yellow medial stripes, and reddish yellow margin; anal fin with 2 narrow pale yellow medial stripes (Indonesia, N. Australia) ***N. celebicus***
(Fig. 42, Plate I, e)

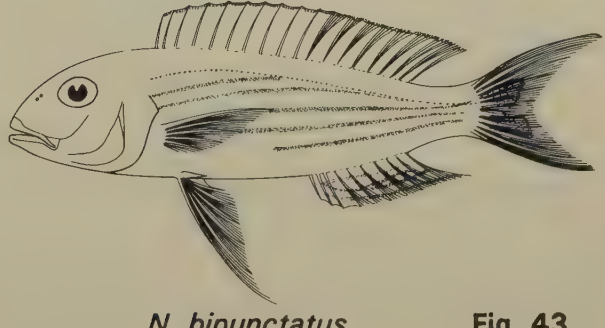
18b. Dorsal fin without stripes, uniformly rosy, with reddish or yellowish margin; anal fin with 2 to 5 yellowish undulating stripes (Indian Ocean) . . . . . ***N. bipunctatus***
(Fig. 43, Plate I, d)

N. theodorei **Fig. 40**

Nemipterus sp. 3 **Fig. 41**



N. celebicus **Fig. 42**



N. bipunctatus **Fig. 43**

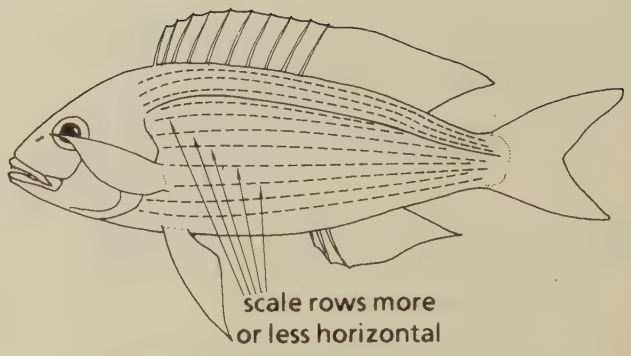
16b. Scales below lateral line in more or less horizontal rows anteriorly (Fig. 44)

20a. Pectoral fins reaching to or short of level of anus

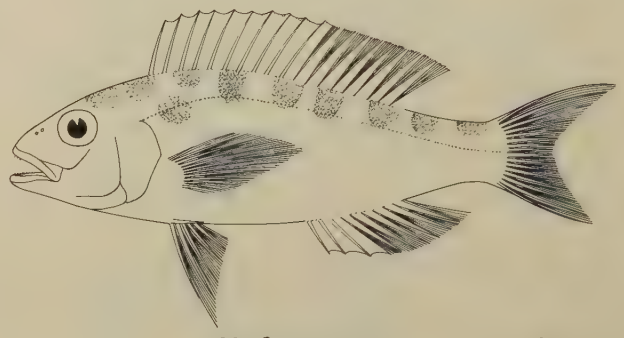
21a. Pelvic fins short, reaching to or short of anus; a line drawn upwards from posterior edge of the suborbital reaching the dorsal profile at about origin of dorsal fin; body pink, with darker saddles on back; caudal fin with lower margin white-edged; dorsal and anal fins without stripes (E. Indian Ocean to W. Pacific) . . . . . ***N. furcosus*** (Fig. 45, Plate I, f)

21b. Pelvic fins very long, reaching to or beyond level of origin of anal fin; a line drawn upwards from posterior edge of the suborbital reaching the dorsal profile 2 or more scale rows before origin of dorsal fin; body pinkish; indistinct narrow, pale yellow stripes on sides, 2 above lateral line, 5 below; dorsal fin pale yellow, lacking stripes; anal fin with faint, broken yellow stripe near base which extends out on posterior rays to tip of fin (S. Indonesia) . ***N. gracilis*** (Fig. 46, Plate I, g)

20b. Pectoral fins reaching to beyond level of anus



longitudinal scale rows **Fig. 44**



N. furcosus **Fig. 45**

N. gracilis **Fig. 46**

22a. Caudal fin forked or lunate, upper lobe falcate; last anal-fin ray elongate, notably longer than other rays; yellow teardrop-shaped bar beneath eye (W. Pacific, from Philippines to N. Australia) . . . . . ***N. isacanthus*** (Fig. 47, Plate II, a)

22b. Caudal fin forked, upper lobe pointed or rounded; last anal-fin ray not notably longer than other rays; yellow bar beneath eye absent

N. isacanthus **Fig. 47**

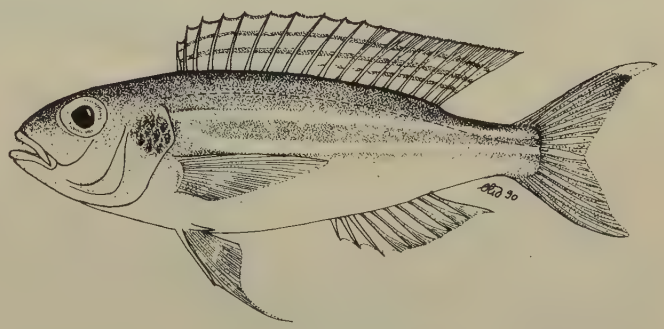
23a. Body deep, depth 2.6 to 3.4 in SL; enlarged canines anteriorly in upper and lower jaws; red ovoid spot present below origin of lateral line; dorsal fin with narrow yellow stripe bordered on either side by translucent interspace that is edged by a narrow pale bluish-white stripe, this stripe extending obliquely upwards to just above mid-posterior margin of fin (W. Pacific, from Andaman Sea to Solomon Is) . . . ***N. hexodon*** (Fig. 48, Plate I, h)

23b. Body moderately elongate, depth 3.1 to 4.0; enlarged canines anteriorly in upper jaw only; red spot below origin of lateral line absent; colour of dorsal fin not as above

N. hexodon **Fig. 48**

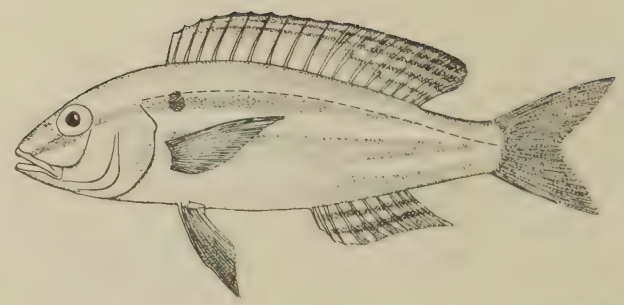
24a. Pelvic fins very long, reaching to or beyond level of origin of anal fin (W. Pacific) . . . . . ***N. nematopus*** (Fig. 49, Plate II, f)

24b. Pelvic fins moderately long, not reaching to level of origin of anal fin



N. nematopus **Fig. 49**

25a. Preopercle naked width 1.4 to 1.7 in scaly width; pectoral-fin length 1.1 to 1.5 in head length; caudal fin pink, with upper tip same colour as rest of fin (Gulf of Thailand, Indonesia) . . . . . ***N. mesoprion***
(Fig. 50, Plate II, d)



N. mesoprion **Fig. 50**

25b. Preopercle naked width 1.8 to 2.4 in scaly width; pectoral-fin length 1.0 to 1.1 in head length; caudal fin pink, with upper tip sulphur-yellow (W. Pacific, from Andaman Sea to Indonesia) . . . . . ***N. tambuloides***
(Fig. 51, Plate III, e)

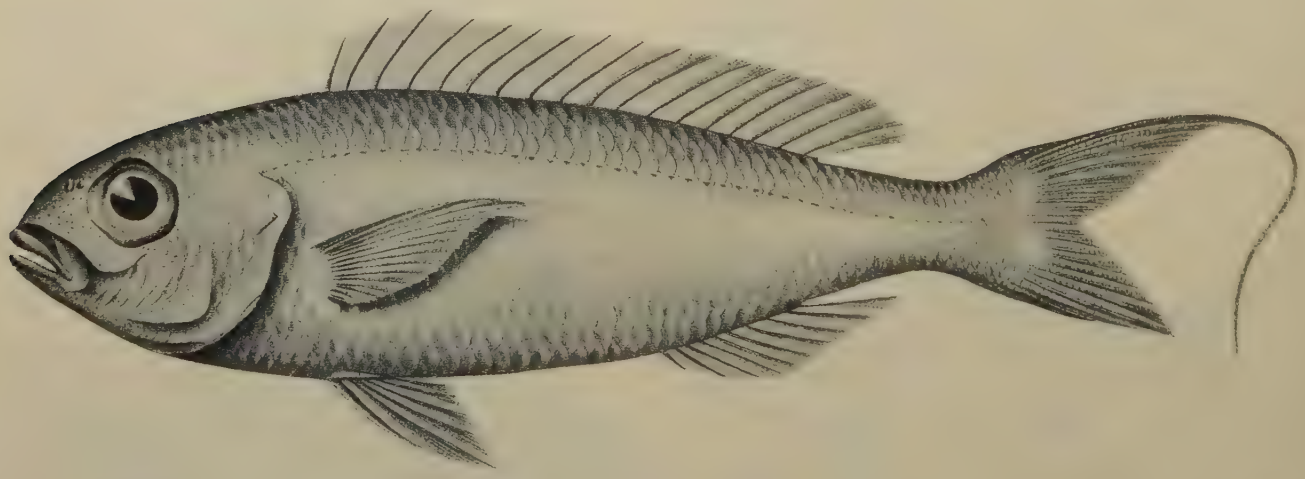
N. tambuloides **Fig. 51**

Nemipterus aurifilum (Ogilby, 1910) Fig. 52 **NEMIP Nem 14**

Pentapus aurifilum Ogilby, 1910, Endeavour Ser., 1: 93 (Southern Queensland).

Synonyms: None.

FAO Names: En - Yellow-lip threadfin bream.



(from Ogilby)

Fig. 52

Diagnostic Features: Body depth 3.2 to 3.8 in SL; snout length a little less than diameter of eye; diameter of eye 2.6 to 3.4 in head length; lower margin of eye tangent to or just below a line from tip of snout to upper base of pectoral fin; interorbital width 1.3 to 1.5 in eye; suborbital depth 2.2 to 4.7 in eye diameter; a line drawn up from the posterior edge of suborbital reaching the dorsal profile at or just behind origin of dorsal fin; preopercle naked width 1.4 to 1.9 in scaly width; pectoral fins moderately long, 1.0 to 1.3 in head length, reaching to or just beyond anus; pelvic fins shorter, 1.3 to 1.6 in head length, reaching to or

just short of anus; caudal fin forked, upper lobe produced into a long trailing filament; 3 or 4 pair of small recurved canines anteriorly in upper jaw; gill rakers 14 to 20. **Colour**: upper part of body red, shading through rose-pink on the sides to pearly-white on the ventral surface; a yellow lateral stripe from upper corner of opercle to upper caudal base; a pair of yellow stripes, united anteriorly, from the isthmus to the lower caudal lobe, passing just outside the bases of the pelvic and anal fins; upper lip saffron-yellow; dorsal, anal, pectoral and pelvic fins hyaline, the dorsal fin edged with gold; caudal fin pink with a broad greenish-yellow edge and the filamentous ray brilliant sulphur-yellow.

Geographical Distribution: Eastern Australia, from southern Queensland to northern New South Wales (Fig. 53).

Fig. 53

Habitat and Biology: A benthic species, found on sand or mud bottoms in depths of 24 to 220 m. Feeds on small crustaceans.

Size: Maximum size is 18.5 cm SL, commonly 14 cm SL.

Interest to Fisheries: Taken by handline and bottom trawl in deeper water off the Queensland coast. Considered a good food fish. No major fishery exists.

Local Names: AUSTRALIA: Yellowlip, Yellowlip butterfly bream (Queensland).

Literature: Grant (1982).

Remarks: This species is very similar to ***N. bathybius***, but can be distinguished by having a more slender body, wider interorbital, and shorter pectoral fins.

Nemipterus balinensis (Bleeker, 1858-9) | Fig. 54, Plate I, a | **NEMIP Nem 15**

Dentex balinensis Bleeker, 1858-9, Nat. Tijdschr. Ned.-Indië, 17: 155 (Boleling, northern Bali).

Synonyms: None.

FAO Names: **En** - Balinese threadfin bream.

Fig. 54

Diagnostic Features: Body depth 3.2 to 4.0 in SL; snout length equal to or less than diameter of eye; diameter of eye 2.3 to 3.2 in head length; lower margin of eye tangent to or just below a line from tip of snout to upper base of pectoral fin; interorbital width 1.4 to 2.4 in eye; suborbital depth 2.6 to 5.4 in eye diameter; a line drawn upwards from the posterior edge of suborbital reaching the dorsal profile 2 to 5 scale rows before origin of dorsal fin; preopercle naked width 1.5 to 2.7 in scaly width; pectoral fins long, 1.1 to 1.2 in head length, reaching to or almost to level of origin of anal fin; pelvic fins moderately long, 1.4 to 1.7 in head length, reaching to or just beyond anus; caudal fin forked, upper lobe produced into a short trailing filament; 3 or 4 pairs of small recurved canines anteriorly in upper jaw; gill rakers 11 to 15. **Colour**: upper part of body pinkish, becoming pearly white below; 2 yellow lateral stripes; the upper stripe fainter and more diffuse, from beneath lateral line behind opercle to upper caudal base, the lower narrow and with a golden sheen from just above pectoral base to middle of caudal base; a pair of lemon-yellow stripes, united anteriorly, from the isthmus to the lower caudal base, passing just outside the bases of the pelvic and anal fins; dorsal fin faintly yellow-suffused, edged with sulphur-yellow and a dusky mauve submarginal stripe; anal fin transparent; caudal fin pinkish-yellow, tip of upper lobe and filament brilliant yellow, edged with red below; pectoral and pelvic fins translucent pink; base of pelvic fins bright yellow.

Geographical Distribution: Southern Indonesia, Sumatra to Flores (Fig. 55).

Habitat and Biology: A benthic species, found on sand or mud bottoms in depths of 50 to 150 m.

Size: Maximum size is 18 cm SL, commonly 12 cm SL.

Interest to Fisheries: Occasionally taken by trawling in inshore waters, but taken mainly by handline. Appears in small numbers in local markets. No major fishery exists.

Local names: INDONESIA: Kurisi.

Literature: Gloerfelt-Tarp & Kailola (1984); Allen & Swainston (1988).

Fig 55

Remarks: This species is very similar to ***N. bathybius***, with which it has probably been confused in the past. ***N. balinensis*** has a more or less straight caudal filament; is more slender (depth 3.2 to 4.0 in SL, versus 2.9 to 3.6) and differs also in colour pattern: the lower lateral stripe originates from above the pectoral-fin base; the dorsal fin lacks undulating yellow lines; and the upper caudal fin and filament is red-edged.

Nemipterus balinensoides (Popta, 1918) | Fig. 56, Plate I, b | **NEMIP Nem 16**

Synagris balinensoides Popta, 1918, Zweite Fortsetzung Beschr. neue Fisharten der Sunda Exp. Leiden: 7 ("Brang Nee Fluss, aus Süsswasser").

Synonyms: None.

FAO Names: En - Dwarf threadfin bream.

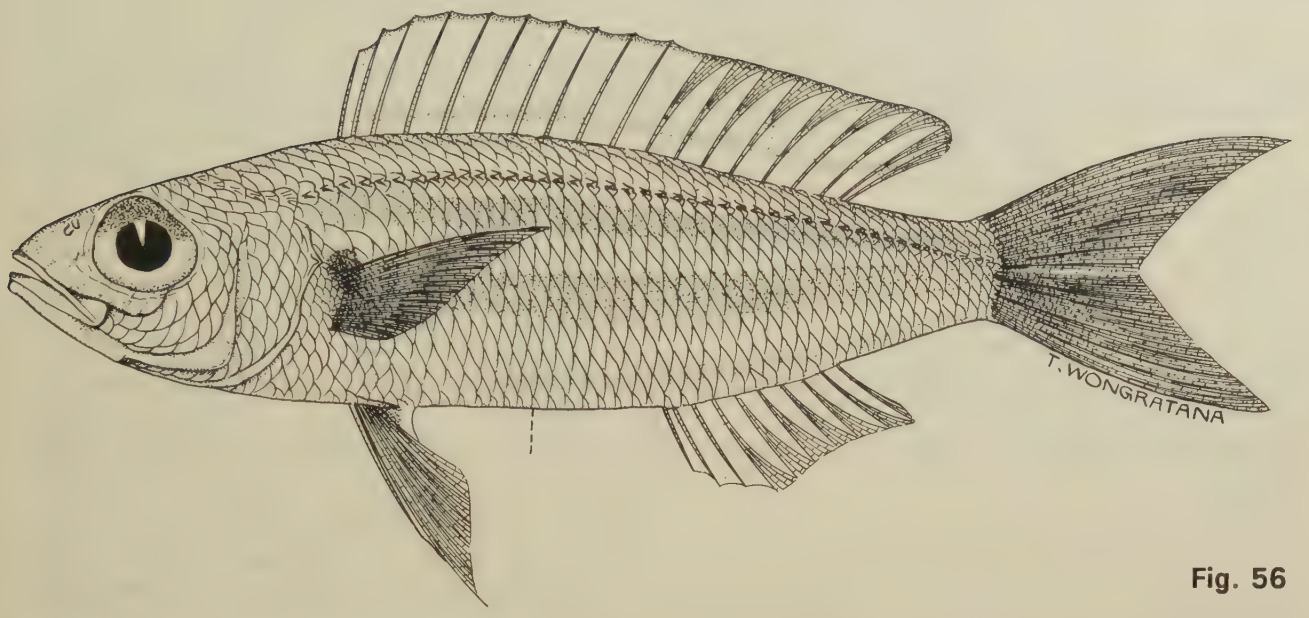


Fig. 56

Diagnostic Features: Body depth 3.8 to 4.4 in SL; snout length equal to or less than diameter of eye; diameter of eye 2.5 to 3.1 in head length; lower margin of eye below a line from tip of snout to upper base of pectoral fin; interorbital width 1.2 to 1.7 in eye; suborbital depth 3.6 to 6.7 in eye diameter; a line drawn up from the posterior edge of suborbital reaching the dorsal profile behind origin of dorsal fin; preopercle naked width 1.3 to 2.4 in scaly width; pectoral fins short, 1.4 to 1.7 in head length, not reaching to anus; pelvic fins moderately long, 1.3 to 1.7 in head length, reaching to or just beyond anus; caudal fin forked, upper lobe slightly longer than lower lobe; 3 or 4 pair of small, recurved canines anteriorly in upper jaw; 4 or 5 pairs of smaller, recurved canines anteriorly in lower jaw, flared outward in larger specimens; gill rakers 15 to 17. **Colour**: pale silvery-rose on upper part of body, silvery below; 2 or 3 pale yellowish stripes along sides, the first just below lateral line, second from behind pectoral-fin base to caudal fin, third (often indistinct) from below pectoral base to lower part of caudal peduncle; a distinct golden-yellow spot, edged red above and below, just above upper pectoral-fin base at beginning of second stripe; opercle silvery; dorsal fin pinkish, edged with greenish-yellow, an indefinite greenish-yellow stripe at base of fin; anal fin translucent whitish; pectoral fins rosy; pelvic fins pale yellow; caudal fin pale yellowish-pink, upper tip dark pink in some specimens.

Geographical Distribution: West Pacific, including the Philippines, Indonesia, New Caledonia, and Phuket Island, Andaman Sea (Fig. 57).

Habitat and Biology: A benthic species, found on sand or mud bottoms in depths between 30 and 80 m.

Size: Maximum size is 12.5 cm SL, commonly 9 cm SL.

Interest to Fisheries: Occasionally taken by trawling in shallow inshore waters. Rarely seen in markets. No major fishery exists.

Fig. 57

Local Names: THAILAND: Pla Sai Dang.

Literature: Wongratana (1974, as ***N. balinensis***); Gloerfelt-Tarp & Kailola (1984, as ***Nemipterus*** sp 2 and ***N.*** sp 4).

Remarks: This species has been confused with ***N. balinensis***, but can be distinguished from that species by its shallower suborbital depth (4.1 to 6.7 in eye) and shorter pectoral fin.

Nemipterus bathybius Snyder, 1911 | Fig. 58, Plate I, c | **NEMIP Nem 1**

Nemipterus bathybius Snyder, 1911, Proc. U.S. Natn. Mus., 40: 532, fig. 6 (Kagoshima, Japan).

Synonyms: None.

FAO Names: En - Yellowbelly threadfin bream.

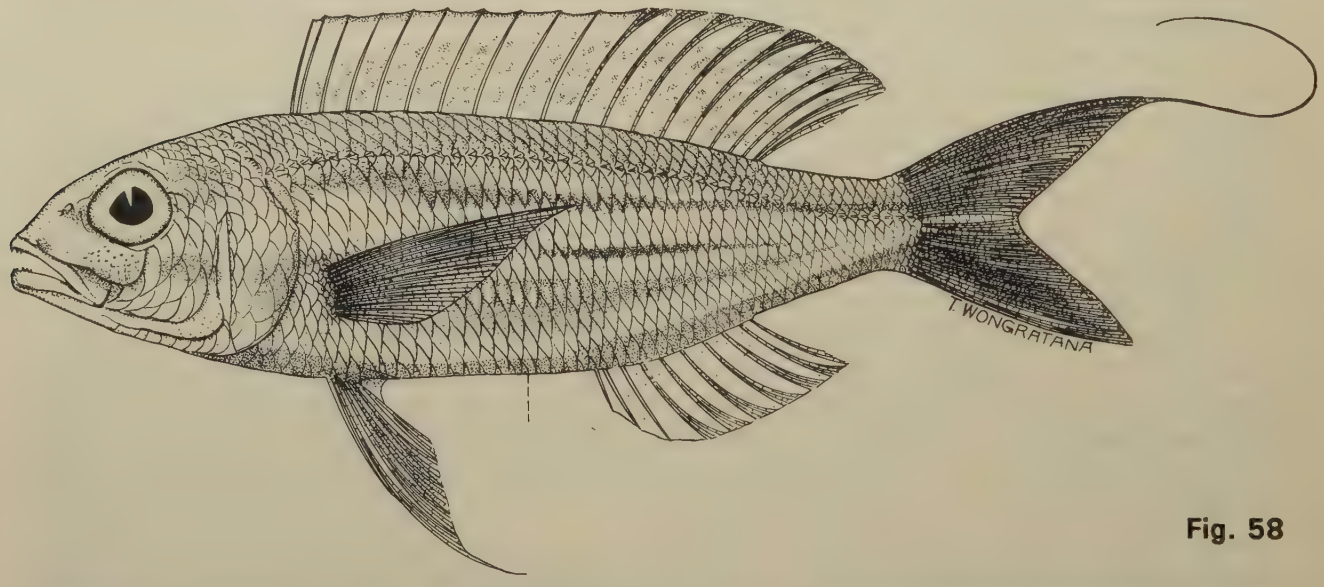


Fig. 58

Diagnostic Features: Body depth 2.9 to 3.6 in SL; snout length equal to or a little less than diameter of eye; diameter of eye 2.7 to 3.6 in head length; lower margin of eye tangent to or just below a line from tip of snout to upper base of pectoral fin; interorbital width 1.3 to 1.9 in eye; suborbital depth 1.9 to 4.7 in eye diameter; a line drawn upwards from the posterior edge of suborbital reaching the dorsal profile in front of origin of dorsal fin; preopercle naked width 1.6 to 2.2 in scaly width; pectoral fins long, 1.0 to 1.4 in head length, reaching almost to level of origin of anal fin; pelvic fins moderately long, 1.1 to 1.6 in head length, reaching beyond anus; caudal fin forked, upper lobe falcate, usually long and ribbon-like in adult specimens; 3 or 4 pairs of small recurved canines anteriorly in upper jaw; gill rakers 13 to 16. **Colour:** upper part of body pinkish, silvery below; 2 yellow lateral stripes, the first beneath lateral line from behind opercle to upper caudal base, the second from behind upper part of pectoral-fin base to middle of caudal base; a pair of yellow stripes, united anteriorly, from the isthmus to the lower caudal base, passing just outside the bases of the pelvic and anal fins; dorsal fin pink, edged with yellow, with a median stripe of yellowish undulating lines; anal fin transparent, pinkish near outer margin; caudal fin pink, upper lobe and filament yellow; other fins hyaline; bases of pelvic fins bright sulphur-yellow.

Geographical Distribution: West Pacific, including southern Japan, South China Sea, Philippines, Indonesia, and northwestern Australia (Fig. 59).

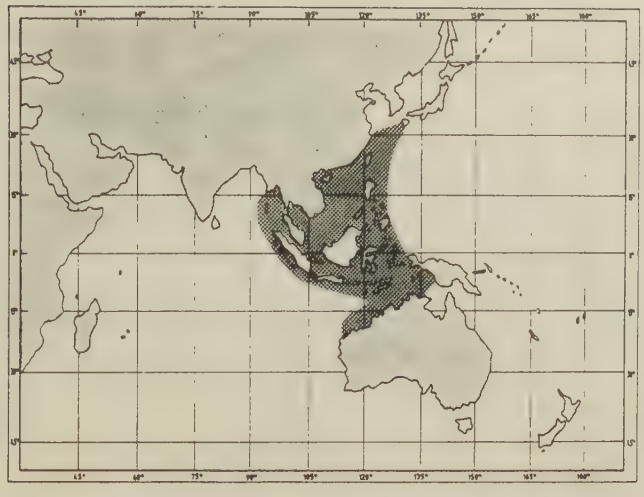


Fig. 59

Habitat and Biology: A benthic species, found on sand or mud bottoms in depths of 35 to 300 m, but most common in depths between 45 and 90 m. Larger fish generally occur in depths greater than 110 m. This species is a rudimentary hermaphrodite, in which all males have functional testes with rudimentary ovarian portions throughout their life. In the S. China Sea, spawning is reported from June to October. The diet of larger fish consists mainly of crustaceans, fish and cephalopods. Young fish (< 120 mm) eat copepods, ostracods and amphipods. Males grow more quickly and to a larger size than females. (Eggleston 1973).

Estimates of the parameters of the von Bertalanffy growth curve made for the population (males) from off Hong Kong (Eggleston, 1973) are: L_∞ = 30.2 cm TL, K = 0.32, t_0 = - 0.80.

Size: Maximum size is 20 cm SL, commonly 16 cm SL.

Interest to Fisheries: Taken in commercial quantities in the South China Sea by longline and bottom trawl. Catch rates are higher in the day-time. Marketed mainly fresh.

Local Names: AUSTRALIA: Yellow-bellied threadfin-bream. JAPAN: Soko-itoyori. PHILIPPINES: Lagao, Silay, Bisugo, Bisugong maylawi.

Literature: Fischer & Whitehead (1974); Masuda et al. (1975, 1984); Rau & Rau (1980); Kyushin et al. (1982); Gloerfelt-Tarp & Kailola (1984); Sainsbury et al. (1984); Shen (1984, as ***N. bathybius*** and ***N. marginatus***); Allen & Swainston (1988).

Nemipterus bipunctatus (Ehrenberg, 1830) | Fig. 60, Plate I, d | **NEMIP Nem 2**

Dentex bipunctatus Ehrenberg in C. & V., 1830b, Hist. nat. poiss., 6: 247 (Djedda, Red Sea).

Synonyms: ***Synagris bleekeri*** Day (1875-77); ***Nemipterus mulloides*** Smith (1939) (preoccupied name); ***Nemipterus delagoae*** Smith (1941) (replacement name).

FAO Names: En - Delagoa threadfin bream. **Fr** - Cohana delagoa. **Sp** - Baga delagoa.

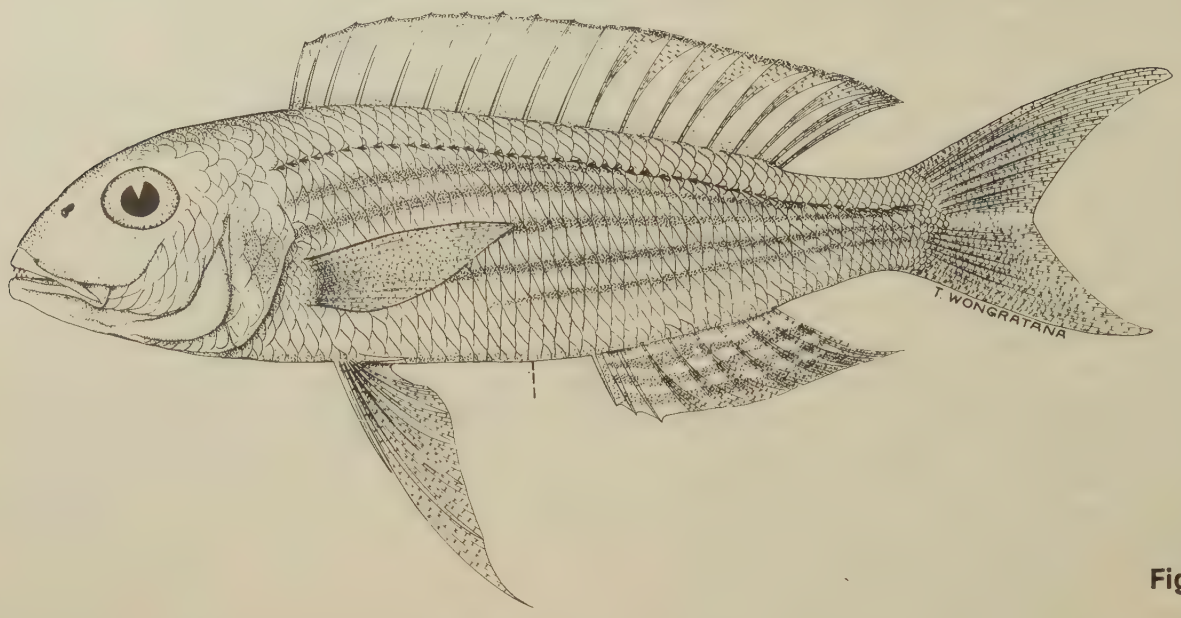


Fig. 60

Diagnostic Features: Body depth 3.4 to 3.9 in SL; snout length about equal to or a little greater than diameter of eye; diameter of eye 3.1 to 3.9 in head length; lower margin of eye tangent to or above a line from tip of snout to upper base of pectoral fin; interorbital width 1.2 to 1.7 in eye; suborbital depth 1.1 to 2.5 in eye diameter; a line drawn up from posterior edge of suborbital reaching the dorsal profile about 3 to 5 scales before origin of dorsal fin; preopercle naked width 1.1 to 1.8 in scaly width; pectoral fins moderately long, 1.2 to 1.5 in head length, reaching to or just beyond anus; pelvic fins long, 0.9 to 1.3 in head length, reaching to or just beyond level of origin of anal fin; caudal fin forked, upper and lower lobes more or less equal in length; scale rows on body below lateral line upward-curved anteriorly; 3 or 4 pairs of small recurved canines anteriorly in upper jaw; gill rakers 10 to 14 (usually 12 to 13). **Colour**: upper part of body pinkish, shading to silvery on the ventral surface; 5 to 7 greenish-yellow upward-curved stripes on body below lateral line; snout with two indistinct bluish or mauve stripes, the first in front of eye, the second from upper lip to eye; dorsal fin pale pink, with a reddish margin and yellow submarginal stripe (lacking in larger specimens); anal fin pale bluish-white with 2 to 4 irregular longitudinal yellow stripes; caudal fin yellowish-pink; other fins translucent.

Geographical Distribution: Indian Ocean, including the Persian Gulf, Red Sea, east Africa south to Delagoa Bay, Mauritius; Seychelles; Madagascar; Arabian Sea, Sri Lanka, Bay of Bengal, Andaman Sea, Strait of Malacca (Fig. 61).

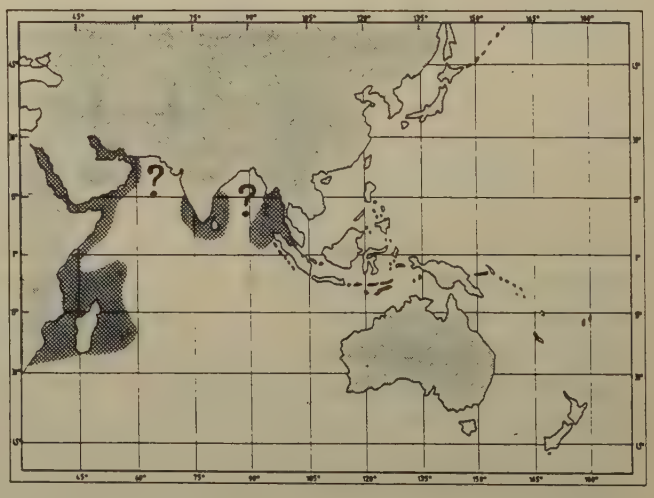


Fig. 61

Habitat and Biology: A benthic species, found on sand or mud bottoms in depths between 18 and 100 m. Feeds mainly on crustaceans, cephalopods (*Loligo*), small fish and polychaetes.

Size: Maximum size is 20 cm SL, commonly 15 cm.

Interest to Fisheries: Taken by handline and bottom trawl. Appears in small numbers in local markets. No major fishery exists.

Local Names: SOUTH AFRICA: Butterfly bream, Vlinderbras; BAHRAIN: Bassi, Bassij; THAILAND: Pla Sai Dang; SEYCHELLES: Mamila; MADAGASCAR: Koana; TANZANIA: Koana; PAKISTAN: Katti (Sindhi), Kolonto (Baluchi).

Literature: Fischer & Whitehead (1974, as ***N. delagoae***); Smith & Smith (1963, as ***N. peronii***); Randall et al. (1978, as ***N. delagoae***); Fischer & Bianchi (1984, as ***N. delagoae***); Bianchi (1985a, as ***N. bleekeri***, 1985b); Bauchot & Bianchi (1984, as ***N. bleekeri***); Kuronuma & Abe (1986, as ***N. delagoae***); Al-Baharna (1986, as ***N. bleekeri***); Smith & Heemstra (1986).

Remarks: This species has generally been reported under the name ***N. delagoae*** or ***N. bleekeri***, both of which are synonyms of ***N. bipunctatus***. The name ***N. bipunctatus***, previously regarded as a synonym of ***N. japonicus***, was resurrected by Russell (1986b).

Nemipterus celebicus (Bleeker, 1854) Fig. 62, Plate I, e **NEMIP Nem 17**

Dentex celebicus Bleeker, 1854, Nat. Tijdschr. Ned.-Indië, 7: 245 (Macassar).

Synonyms: None.

FAO Names: En - Celebes threadfin bream.

Fig. 62

Diagnostic Features: Body depth 2.9 to 4.2 in SL; snout length about equal to or greater than diameter of eye; diameter of eye 3.0 to 4.0 in head length; lower margin of eye tangent to or just above a line from tip of snout to upper base of pectoral fin; interorbital width 1.2 to 1.8 in eye; suborbital depth 1.0 to 3.0 in eye diameter; a line drawn up from posterior edge of suborbital reaching the dorsal profile about 2 to 4 scales before origin of dorsal fin; preopercle naked width 1.1 to 1.8 in scaly width; pectoral fins long, 1.1 to 1.4 in head length, reaching to between level of anus and origin of anal fin; pelvic fins very long, 0.9 to 1.4 in head length, reaching to or beyond level of origin of anal fin; caudal fin forked, upper lobe slightly rounded, without filament; scale rows on body below lateral line upward-curved anteriorly; 3 pair of small recurved canines anteriorly in upper jaw; gill rakers 10 to 14. **Colour:** upper part of head and body pinkish, paling to silvery white on ventral surface; violet and reddish reflections on scales above lateral line; indefinite pale golden or yellowish stripe along lateral line and narrow golden stripe on each of 4 scale rows below lateral line, these stripes ascending slightly before level of anal fin; head with golden and mauve reflections; traces of 2 silvery-mauve lines in

front of and below eye; bluish-mauve spot on upper part of opercle; upper lip yellow; dorsal fin translucent pink, with narrow reddish-yellow margin and 2 or 3 narrow yellow stripes along median part of fin; anal fin translucent with 2 narrow pale yellow stripes along median part of fin; caudal fin pale golden, upper tip rosy; pectoral fins pale pink; pelvic fins translucent white.

Geographical Distribution: Indonesia, northern Australia (Fig. 63).

Habitat and Biology: A benthic species, found on sand or mud bottoms in depths of 30 to 100 m. Feeds mainly on small crustaceans.

Size: Maximum size is 22 cm SL, commonly 15 cm SL.

Interest to Fisheries: Taken by line and bottom trawl. Appears in local fish markets in Indonesia; taken commercially by trawlers in northern Australian waters together with other species. No major fishery exists.

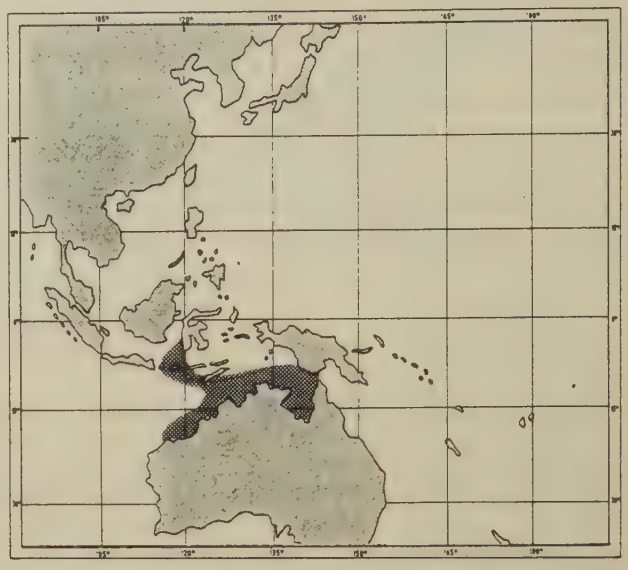


Fig. 63

Local Names: AUSTRALIA: Five-lined threadfin bream. INDONESIA: Kurisi.

Literature: Gloerfelt-Tarp & Kailola (1984); Sainsbury et al. (1984); Allen & Swainston (1988).

Nemipterus furcosus (Valenciennes, 1830) Fig. 64, Plate I, f **NEMIP Nem 10**

Dentex furcosus Valenciennes in C. & V., 1830b, Hist. nat. poiss., 6: 244 (Trinquemalé = Trincomalee, Sri Lanka).

Synonyms: ***Dentex upeneoides*** Bleeker (1852c); ***Dentex ovenii*** Bleeker (1854); ***Dentex hypselognathus*** Bleeker (1873); ***Dentex sundanensis*** Bleeker (1873); ***?Genyorage rubicauda*** Saville-Kent (1893) (*nomen nudum* for ***Lutianus rubicundus*** De Vis ms *fide* Ogilby, 1918); ***Nemipterus worcesteri*** Evermann & Seale (1907); ***Nemipterus robustus*** Ogilby (1916) (replacement name for ***Synagris furcosus*** Günther, not ***Dentex furcosus*** Valenciennes); ***Nemipterus guntheri*** Ogilby (1918) (replacement name for ***Synagris furcosus*** Günther, not ***Dentex furcosus*** Valenciennes).

FAO Names: **En** - Fork-tailed threadfin bream.

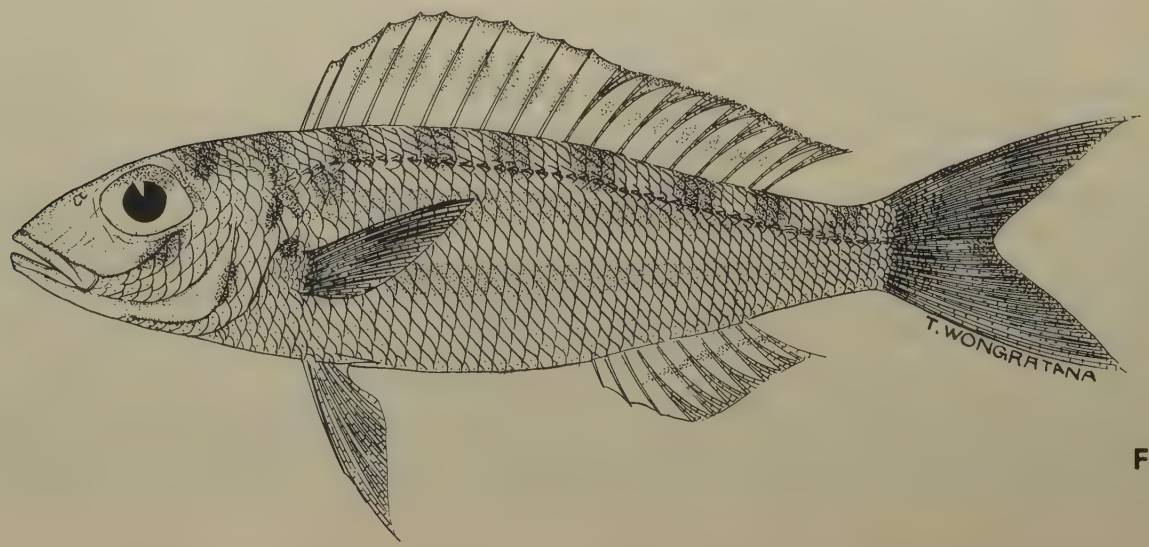


Fig. 64

Diagnostic Features: Body depth 3.0 to 3.9 in SL; snout length equal to or greater than diameter of eye; diameter of eye 2.8 to 4.0 in head length; lower margin of eye tangent to or above a line from tip of snout to upper base of pectoral fin; interorbital width 1.1 to 1.7 in eye; suborbital depth 0.9 to 1.9 in eye diameter; a line drawn up from posterior edge of suborbital reaching the dorsal profile at about origin of dorsal fin; preopercle naked width 1.0 to 1.4 in scaly width; pectoral fins moderately long, 0.8 to 1.1 in head length, reaching to or just short of level of anus; pelvic fins moderately long, 1.3 to 1.7 in head length, reaching to or just short of level of anus; caudal fin deeply forked; 2 or 3 pair of small recurved canines anteriorly in upper jaw; gill rakers 9 to 12. **Colour**: head and body pale iridescent pink, paling on sides to silvery-white below; back with 9 indistinct cross bars, extending to just beneath lateral line; third bar somewhat darker and more distinct, forming a reddish shoulder spot behind origin of lateral line in some specimens; traces of indistinct yellowish stripes along body, one above and several below lateral line; cheeks and opercle silvery, upper jaw rosy, lower jaw silvery; eye rosy; dorsal fin pale rosy, sometimes with yellowish tinge, outer margin darker pink; anal fin bluish white, with row of transparent or faint yellowish spots near base; caudal fin pale rosy, with yellow tinge, lower margin of fin white; pelvic fins and axillary scales white; pectoral fins rosy.

Geographical Distribution: West Pacific from southern Japan to northeastern Australia, and Indian Ocean including the Gulf of Mannar, Sri Lanka, Andaman Sea, Strait of Malacca and northwestern Australia (Fig. 65).

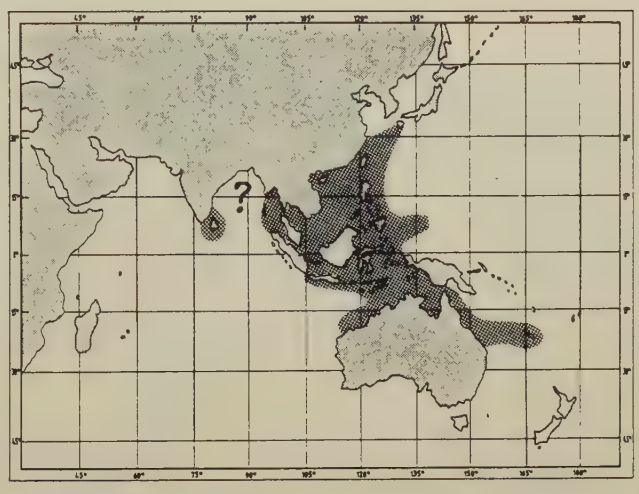


Fig. 65

Habitat and Biology: A benthic species, inhabiting sand and mud bottoms in depths of 8 to 110 m. Females predominate at small size classes while males dominate the larger size classes, and there is some evidence of this species being a sequential hermaphrodite (Young & Martin, 1985). Ripe females occur all year round in the population from the northwest shelf of Australia, but a higher proportion of ripe fish is present in November and December. Feeding occurs during the day, with crustaceans and small fishes predominating.

Estimates of the parameters of the von Bertalanffy growth curve made for the population from the northwest shelf of Australia (Sainsbury & Whitelaw, 1984, as ***N. peronii***) are: L_∞ = 41.9 cm FL, K = 0.25, t_0 = 0.74

Size: Maximum size is 22.5 cm SL, commonly 18 cm SL.

Interest to Fisheries: Taken by handline and bottom trawl. Appears in local fish markets. Considered a good food fish and fished commercially by trawlers together with other species. ***N. furcosus*** is the principal catch species in the Taiwanese pair-trawl fishery off the coast of northwestern Australia.

Local Names: AUSTRALIA: Rosy threadfin-bream. PHILIPPINES: Lagao.

Literature: Fischer & Whitehead (1974, as ***N. peronii***); Masuda et al. (1975, 1984, as ***N. peronii***); Rau & Rau (1980, as ***N. peronii***); Grant (1982, as ***N. upeneoides***); Gloerfelt-Tarp & Kailola (1984); Sainsbury et al. (1984); Allen & Swainston (1988).

Remarks: Most authors have incorrectly applied the name ***N. peronii*** to this species, but ***N. peronii*** is a senior synonym of ***N. tolu*** and ***N. furcosus*** is the correct name for this species.

Nemipterus gracilis (Bleeker, 1873) Fig. 66, Plate I,g **NEMIP Nem 18**

Dentex gracilis Bleeker, 1873, Verh. Akad. Amsterdam, 13: 34 (Java; Nias; Celebes; Amboina).

Synonyms: ***Latilus upeneoides*** Bleeker (1845) (*nomen nudum*).

FAO Names: En - Graceful threadfin bream.

Fig. 66

Diagnostic Features: Body depth 3.4 to 3.9 in SL; snout length equal to or greater than diameter of eye; diameter of eye 2.7 to 3.6 in head length; lower margin of eye tangent to or just above a line from tip of snout to upper base of pectoral fin; interorbital width 0.9 to 1.8 in eye; suborbital depth 1.1 to 2.8 in eye diameter; a line drawn up from posterior edge of suborbital reaching the dorsal profile about 1 to 4 scale rows before origin of dorsal fin; preopercle naked width 1.2 to 1.9 in scaly width; pectoral fins moderately long, 1.1 to 1.4 in head length, reaching to about level of anus; pelvic fins very long, 0.9 to 1.3 in head length, reaching to between level of origin of anal fin and third anal spine; caudal fin forked, upper lobe slightly rounded; 3 or 4 pair of small recurved canines anteriorly in upper jaw; gill rakers 11 to 15. **Colour:** body pinkish above with silvery blue reflections, silvery on ventral half; scale rows on body with pale yellow stripes, 2 rows above lateral line, 5 rows below; head pinkish mauve with golden reflections; faint yellow stripe through nostril, and golden yellow stripe from upper lip to below eye (continued across preopercle and opercle in larger specimens); snout with violet reflections; lips yellow or reddish yellow; upper and middle part of opercle faint yellow; dorsal fin pink with narrow yellow margin and pinkish-red submargin, and broad median stripe of pale yellow (this stripe broken along its length by a series of pale mauve spots or continuous pale line in some specimens); anal fin transparent with faint, broken yellowish stripe near base which extends out on posterior rays to tip of fin; caudal fin pink, upper lobe yellowish and upper tip reddish; pectoral fins transparent; pelvic fins pale whitish, base of fins lemon-yellow.

Geographical Distribution: Indonesia: Sumatra to Flores (Fig. 67).

Habitat and Biology: A benthic species, occurs on mud or sand bottoms in depths of 30 to 90 m. Females with ripe ova were present in June in Flores.

Size: Maximum size is 18 cm SL, commonly 15 cm SL.

Interest to Fisheries: Taken by handline. Appears in small quantities in local markets. No major fishery exists.

Literature: Gloerfelt-Tarp & Kailola (1984, as ***Nemipterus* sp. 1**)

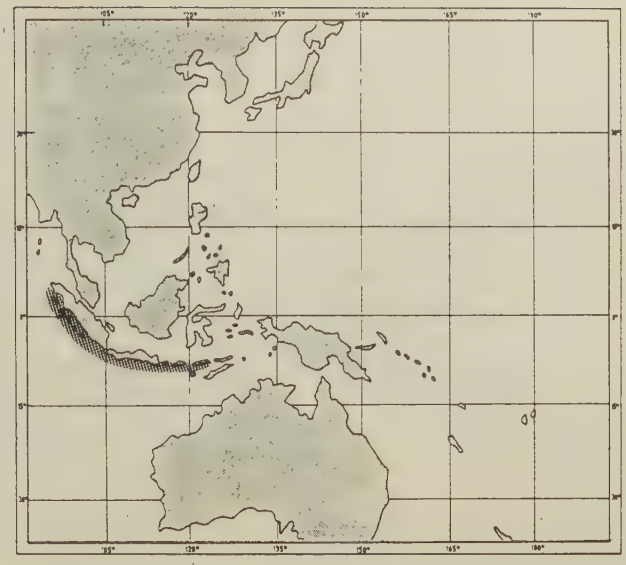


Fig. 67

Remarks: This species has been little recognized since its original description.

Nemipterus hexodon (Quoy & Gaimard, 1824) Fig. 68, Plate I,h **NEMIP Nem 3**

Dentex hexodon Quoy & Gaimard, 1824, Voy. "Uranie", Zool., : 301 (Timor).

Synonyms: ***Dentex (Synagris) notatus*** Day (1870); ***Dentex taeniopterus*** Valenciennes in C. & V. (1830b); ***Dentex ruber*** Valenciennes in C. & V. (1830b).

FAO Names: **En** - Ornate threadfin bream.

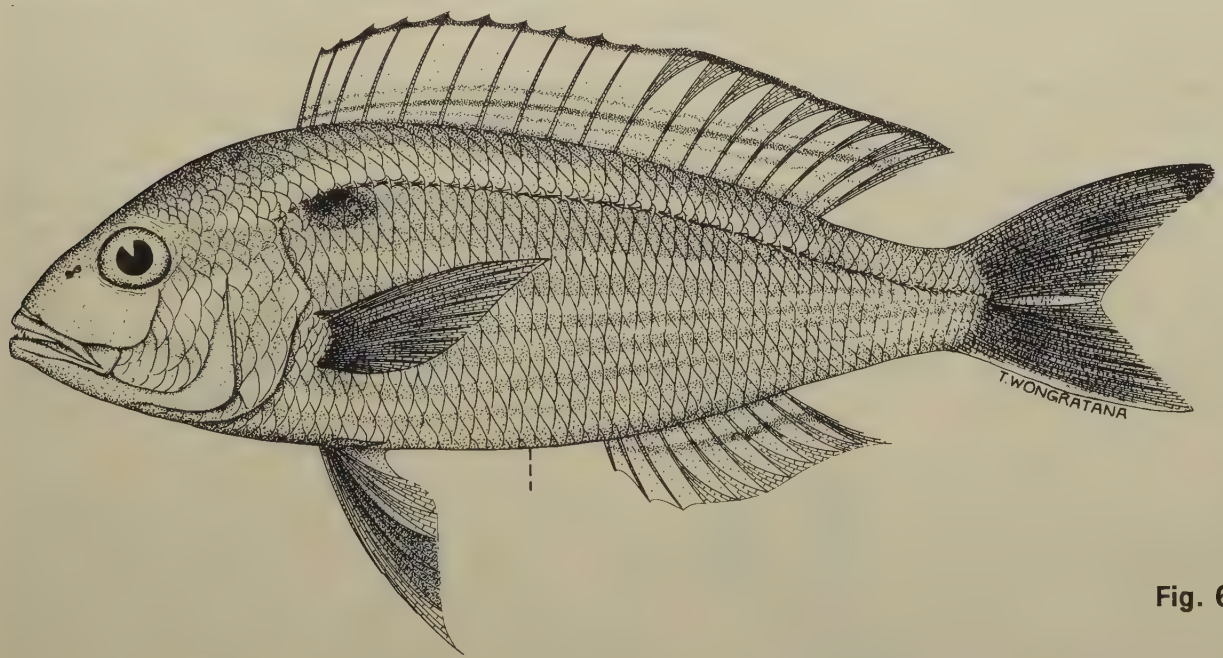


Fig. 68

Diagnostic Features: Body depth 2.6 to 3.4 in SL; snout length equal to or greater than diameter of eye; diameter of eye 3.2 to 4.6 in head length; lower margin of eye above a line from tip of snout to upper base of pectoral fin; interorbital width 1.3 to 1.9 in eye; suborbital depth 0.9 to 1.8 in eye diameter; a line drawn up from posterior edge of suborbital reaching the dorsal profile about 2 to 6 scale rows before origin of dorsal fin; preopercle naked width 1.3 to 1.9 in scaly width; pectoral fins long, 1.0 to 1.4 in head length, reaching to or beyond

level of anus; pelvic fins long, 1.2 to 1.6 in head length, reaching to or just beyond level of anus; caudal fin forked, upper lobe slightly longer than lower; 3 or 4 pair of small recurved canines anteriorly in upper jaw; gill rakers 11 to 17. **Colour**: upper part of body pinkish, paling to silvery white on ventral surface; 6 to 8 pale yellow stripes on sides from below lateral line; blood red, ovoid spot below origin of lateral line, bordered below by bright yellow; yellow stripe on either side of ventral midline, from isthmus to lower caudal base; golden reflections behind eye, on cheeks and opercle; dorsal fin translucent whitish, with a yellow margin; a narrow yellow stripe beginning anteriorly near base of fin and extending backwards to just above midposterior margin, this stripe bordered on either side by a translucent interspace that is edged by a narrow pale bluish-white stripe; caudal fin pinkish, upper lobe tipped with yellow; anal fin translucent; a narrow yellow stripe running from near anterior base of fin to midposterior margin (extending to tip of fin along posterior ray in larger specimens); base of fin beneath this stripe pale bluish white; pectoral and pelvic fins pale translucent pink; base of pelvic fins and axillary scale lemon-yellow.

Geographical Distribution: Indo-West Pacific from the Andaman Sea to the Solomon Islands (Fig. 69).

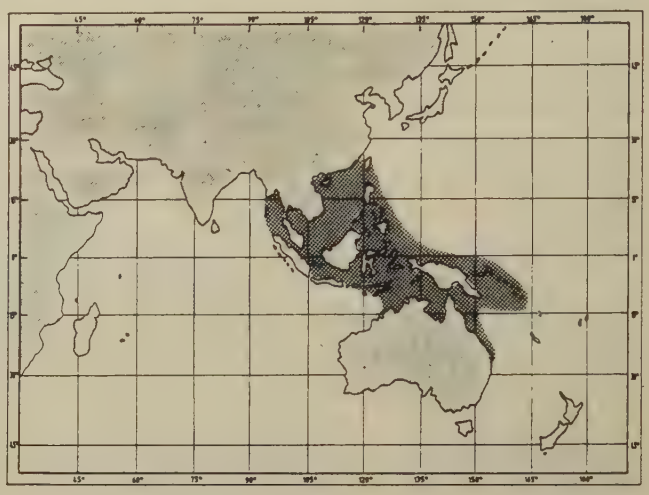


Fig. 69

Habitat and Biology: A benthic species, occurs on mud or sand bottoms in depths of 10 to 80 m, but is most abundant in depths of 20 to 50 m. Biological data on ***N. hexodon*** has been summarized by Isarankura (1970). Females predominate at small sizes and males at larger sizes as a result of faster growth rates in males. In the Gulf of Thailand spawning probably occurs between February and March. Feeds mainly on small shrimps, squid, small fishes and benthic animals.

Size: Maximum size is 21 cm SL, commonly 15 cm SL.

Interest to Fisheries: Taken by handline and bottom trawl together with other demersal fishes throughout the year. Appears in local markets. No major fishery exists.

Local Names: INDONESIA: Jamban, gresik. PHILIPPINES: Silay, Bagu, Bakag, Bisugong maylawi. THAILAND: Pla Sai Dang. MALAYSIA: Kerisi, gurisi merah, pasir-pasir. AUSTRALIA: Ornate threadfin bream, yellow-banded butterfly-bream, rainbow perch, gold perch (Queensland).

Literature: Rau & Rau (1980); Gloerfelt-Tarp & Kailola (1984); Sainsbury et al. (1984); Allen & Swainston (1988).

Nemipterus isacanthus (Bleeker, 1873) Fig. 70, Plate II, a **NEMIP Nem 19**

Dentex isacanthus Bleeker, 1873, Verh. Akad. Amsterdam, 13: 13 (Batavia, Java; Padang, Sumatra).

Synonyms: None.

FAO Names: En - Teardrop threadfin bream.

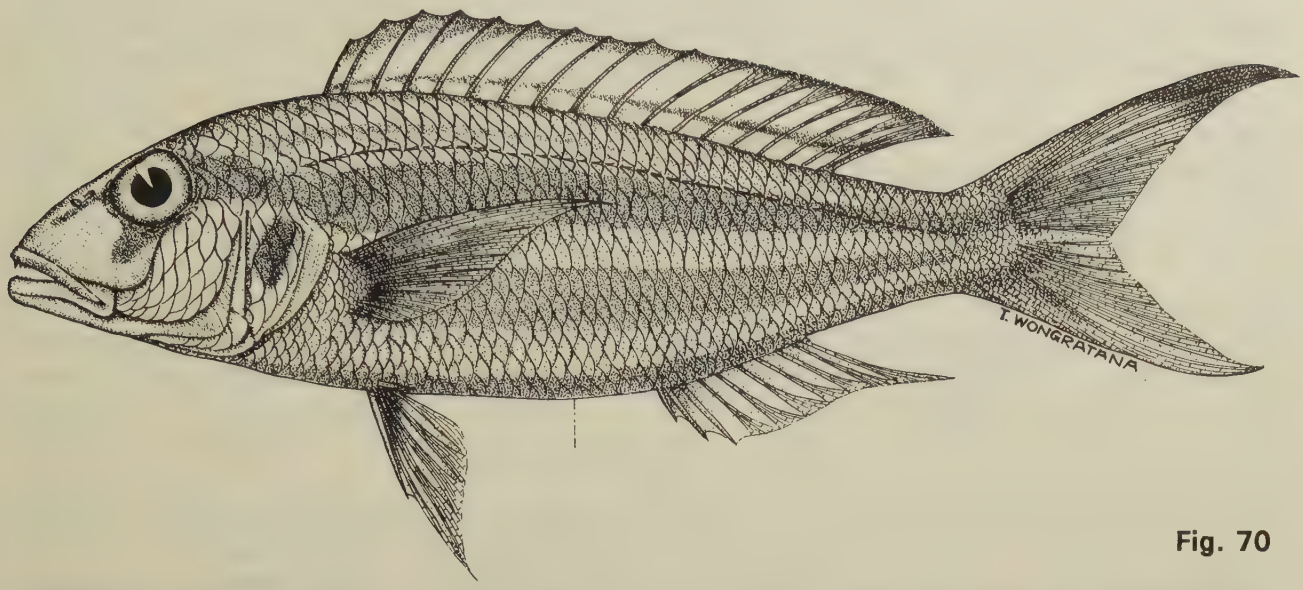


Fig. 70

Diagnostic Features: Body depth 3.0 to 3.5 in SL; snout length equal to or greater than diameter of eye; diameter of eye 3.0 to 3.7 in head length; lower margin of eye above a line from tip of snout to upper base of pectoral fin; interorbital width 1.4 to 1.9 in eye; suborbital depth 1.1 to 2.1 in eye diameter; a line drawn up from posterior edge of suborbital reaching the dorsal profile about 2 to 7 scale rows before origin of dorsal fin; preopercle naked width 1.7 to 2.7 in scaly width; pectoral fins long, 1.0 to 1.4 in head length, reaching to beyond level of anus; pelvic fins moderately long, 1.3 to 1.6 in head length, reaching to between just short of and just beyond level of anus; caudal fin deeply forked, upper lobe falcate; 3 pair of small recurved canines anteriorly in upper jaw; gill rakers 11 to 14. **Colour**: body pinkish mauve, silvery on lower part of sides and ventral surface; top of head and back yellow-tinged pink; two broad pale golden stripes along body; the first from beneath origin of lateral line to upper caudal-fin base; the second from behind pectoral-fin base to lower caudal-fin base; pale yellow stripe on either side of ventral midline; snout pinkish; yellow teardrop-shaped bar beneath eye, extending obliquely forwards about halfway down suborbital; upper lip yellow; bluish patch on upper part of opercle; dorsal fin translucent, with narrow, red-edged yellow margin, and narrow yellow submedial stripe; caudal fin pink, tip of upper lobe bright yellow, lower lobe yellow-tinged; anal fin and pelvic fins translucent whitish; pectoral fins translucent pinkish.

Geographical Distribution: West Pacific, including the Philippines, Gulf of Thailand, Strait of Malacca, Indonesia and northern Australia (Fig. 71).

Habitat and Biology: A benthic species, occurs on mud or sand bottoms in depths greater than 50 m.

Size: Maximum size 21 cm SL, commonly 17 cm SL.

Interest to Fisheries: Taken by handline and bottom trawl together with other species. Appears occasionally in local markets. No major fishery exists.

Fig. 71

Local Names: AUSTRALIA: Twin-lined threadfin-bream.

Literature: Gloerfelt-Tarp & Kailola (1984); Sainsbury et al. (1984, as ***N. mesoprion*** and ***N. isacanthus***); Allen & Swainston (1988).

Remarks: The name ***N. isacanthus*** has been little recognized since its original description, and the name ***N. bleekeri*** has been misapplied to this species by some authors.

Nemipterus japonicus (Bloch, 1791) | Fig. 72, Plate II,b | **NEMIP Nem 4**

Sparus japonicus Bloch, 1791, Naturges. Ausländ. Fische, 5: 110 (no type locality given).

Synonyms: ?***Coryphaena lutea*** Schneider in Bloch & Schneider (1801); ***Cantharus filamentosus*** Rüppell (1828-31 [1828]); ***Dentex tambulus*** Valenciennes in C. & V., (1830b); ?***Dentex striatus*** Valenciennes in C. & V., (1830b); ***Dentex blochii*** Bleeker (1851c); ***Synagris grammicus*** Day (1865); ***Heterognathodon flaviventris*** Steindachner (1866); ***Synagris flavolinea*** Fowler (1931a).

FAO Names: **En** - Japanese threadfin bream. **Fr** - Cohana japonaise. **Sp** - Baga japonesa.

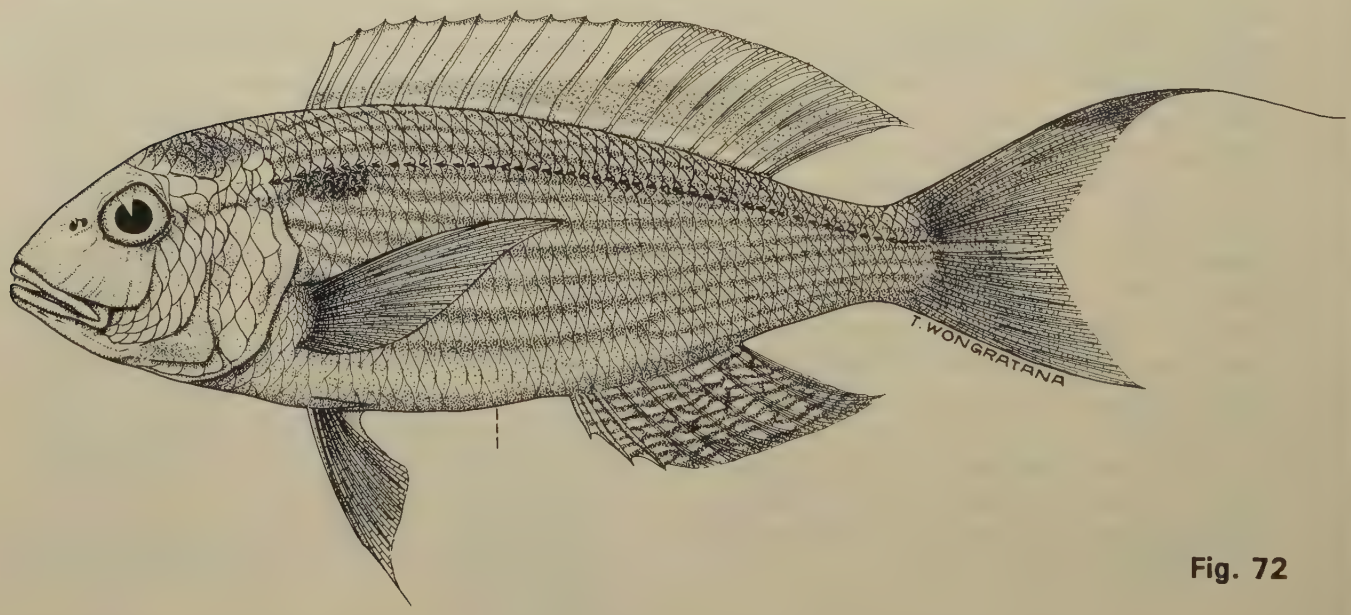


Fig. 72

Diagnostic Features: Body depth 2.7 to 3.5 in SL; snout length equal to or greater than diameter of eye; diameter of eye 3.2 to 4.4 in head length; lower margin of eye above a line from tip of snout to upper base of pectoral fin; interorbital width 1.0 to 1.9 in eye; suborbital depth 1.0 to 1.9 in eye diameter; a line drawn up from the posterior edge of suborbital reaching the dorsal profile 2 to 4 scale rows before origin of dorsal fin; preopercle naked width 1.1 to 2.0 in scaly width; pectoral fins very long, 1.0 to 1.3 in head length, reaching to or just beyond level of origin of anal fin; pelvic fins moderately long, 1.2 to 1.6 in head length, reaching to or just beyond anus; caudal fin moderately forked, upper lobe slightly longer than lower and produced into a short or moderately long filament; 4 or 5 pair of small recurved canines anteriorly in upper jaw; gill rakers 14 to 17. **Colour**: upper part of body pinkish, becoming silvery below; top of head behind eye with a golden sheen; 11 to 12 pale golden-

yellow stripes along body from behind head to base of caudal fin; a prominent red-suffused yellow blotch below origin of lateral line; dorsal fin whitish, margin of fin yellow, edged with red; a pale lemon stripe near base of dorsal fin, this stripe narrow anteriorly and widening on posterior part of fin; anal fin whitish with pale lemon broken lines or scribblings over most of fin; pectoral fin translucent pinkish; pelvic fins whitish with yellow axillary scale; caudal fin pink, upper tip and filament yellow.

Geographical Distribution: Widespread throughout the Indian Ocean and West Pacific. A report on ***N. japonicus*** as a Red Sea immigrant into the Mediterranean (Fischer & Whitehead, 1974) is unconfirmed (A. Ben-Tuvia, *pers. comm.*, 1984). Similarly, a record of this species from northwestern Australia by Allen & Swainston (1988) is without basis (Fig. 73).

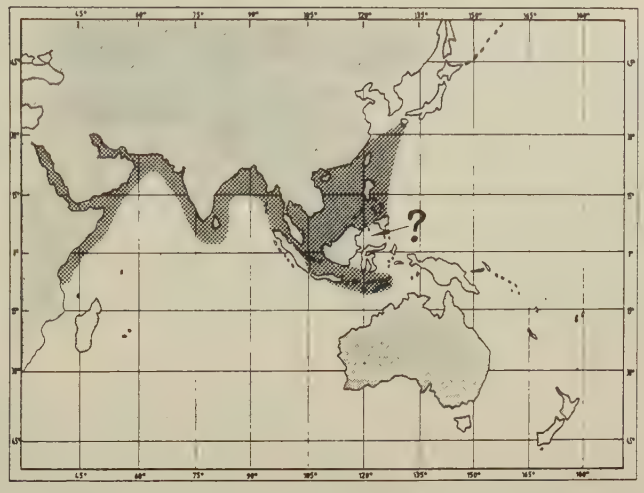


Fig. 73

Habitat and Biology: A benthic species, very abundant in coastal waters, found on mud or sand bottoms in 5 to 80 m, usually in schools. Small fish are generally most abundant in less than 27 m depth; only larger fish occur in depths greater than 45 m (Eggleston, 1973). Females predominate at small sizes and males at large sizes, due to faster growth rates in males (Lee, 1974). Spawning occurs over an extended period, and is reported to take place from May to October in the South China Sea (Eggleston, 1973); from November to February in East Malaysian waters (Weber & Jothy, 1977); January and February off the coast of Mangalore, India (Kuthalingam, 1965); September to November (Krishnamoorthi, 1972), and December to February and June and July (Dan, 1980) at Waltair, India; and August to April at Kakinada, India (Murty, 1984). The diet consists mainly of small fishes, crustaceans, molluscs, (mainly cephalopods), polychaetes and echinoderms.

Estimates of the parameters of the von Bertalanffy growth curve made for the population from Kakinada, India (Murty, 1984) are: L_∞ = 31.4 cm TL, K = 0.75, t_0 = - 0.17; for the population from Madras, India (Vivekanandan & James, 1986) are: L_∞ = 30.5 cm TL, K = 1.00, t_0 = 0.23; and for the population off the Strait of Malacca (Kedah State, Malaysia) (Isa, 1988) are: L_∞ = 31.4 cm TL, K = 0.55.

Size: Maximum size is 25 cm SL, commonly 15 cm SL.

Interest to Fisheries: Taken in commercial quantities by longlines, bottom trawls and gill nets. Juveniles are also caught in considerable quantities by shrimp trawlers using beam trawls. ***N. japonicus*** constitutes an important part of the trawl catch in the South China Sea (Eggleston, 1973; Lee, 1974; Weber & Jothy, 1977), Andaman Sea (Senta and Tan, 1975) and W. Bay of Bengal (Krishnamoorthi, 1972). Marketed mainly fresh, but also steamed, dried salted, dry-smoked, fermented or made into fish balls and fish meal. In the Philippines this species is especially valued in a convalescent diet.

Local Names: PHILIPPINES: Silay, Bakag, Bisugong bututan (Tagalog). JAPAN: Nihon-itoyori. MALAYSIA: Kerisi. THAILAND: Pla Sai Dang. INDIA: Rane (Goa). INDONESIA: Kerisi, Krisi (Java), Gurisi (W.Java-Jakarta). KUWAIT: Bassi. BAHRAIN: Bassi, Bassij. PAKISTAN: Katti (Sindhi), Kolonto (Baluchi). TANZANIA: Koana. MADAGASCAR: Koana. BURMA: Shwe-nga. VIETNAM: Ca dong. HONG KONG: Kwa sam.

Literature: Kuronuma & Abe (1972); Lee (1974); Fischer & Whitehead (1974); Senta and Tan (1975); Randall et al. (1978); Rau & Rau (1980); Kyushin et al. (1982); Tan et al. (1982); Bianchi (1985a, 1985b); Bauchot & Bianchi (1984); Gloerfelt-Tarp & Kailola (1984); Al-Baharna (1986); Kuronuma & Abe (1986).

Nemipterus marginatus (Valenciennes, 1830) Fig. 74, Plate II, c **NEMIP Nem 20**

Dentex marginatus Valenciennes in C. & V., 1830b, Hist. nat. poiss., 6: 245 (Vanicolo; Java).

Synonyms: None.

FAO Names: En - Red filament threadfin bream.

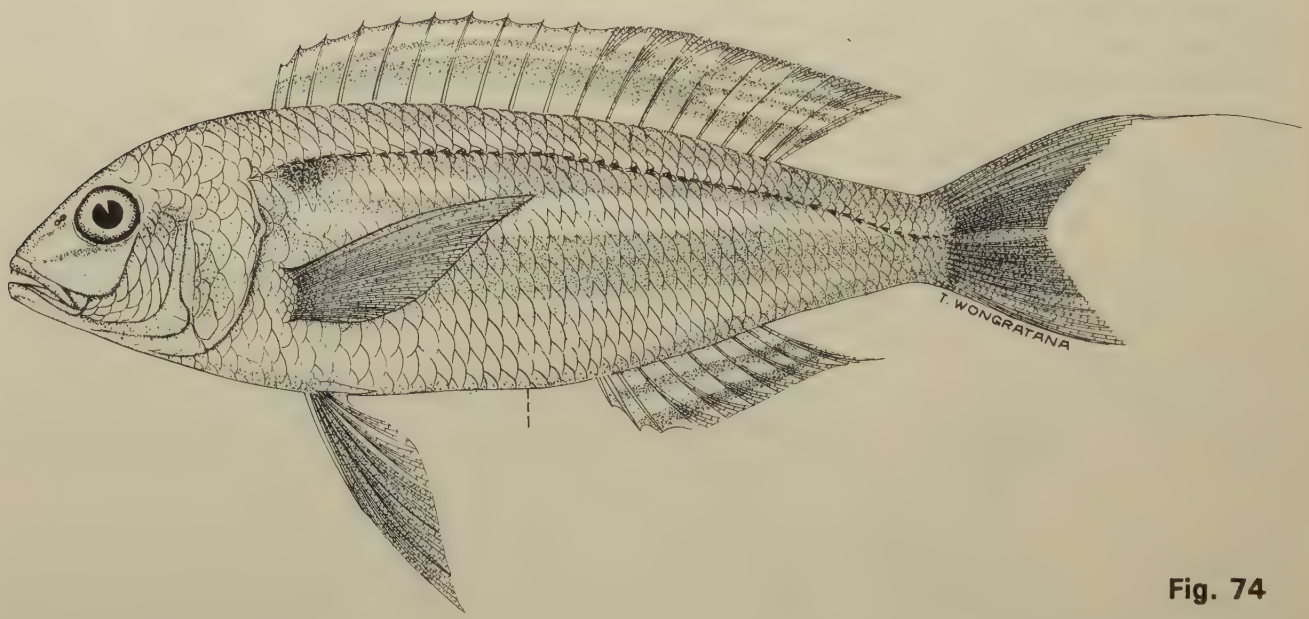


Fig. 74

Diagnostic Features: Body depth 3.1 to 3.8 in SL; snout length about equal to or a little longer than diameter of eye; diameter of eye 3.4 to 4.3 in head length; lower margin of eye above a line from tip of snout to upper base of pectoral fin; interorbital width 1.5 to 2.2 in eye; suborbital depth 1.0 to 2.6 in eye diameter; a line drawn up from the posterior edge of suborbital reaching the dorsal profile about 2 to 5 scale rows before origin of dorsal fin; preopercle naked width 1.3 to 1.9 in scaly width; pectoral fins long, 0.9 to 1.3 in head length, reaching to between level of anus and origin of anal fin; pelvic fins long, 0.9 to 1.3 in head length, reaching to or just behind level of origin of anal fin; caudal fin forked, upper lobe produced into a short filament; 3 to 5 pair of small recurved canines anteriorly in upper jaw; gill rakers 11 to 15. **Colour:** upper part of body rosy, silvery-white below; head with a narrow yellow stripe from below nostrils to eye and from middle of upper jaw to eye; a broad yellowish-orange stripe, divided above pectoral fin, along body from below origin of lateral line to upper part of caudal peduncle, this stripe with a reddish spot near its origin; a second yellowish-orange stripe from above base of pectoral fin to lower part of caudal peduncle; dorsal fin pale bluish, with a yellow margin and a broad yellow median stripe which subdivides into 3 yellow stripes posteriorly; anal fin pale bluish with 2 narrow yellow stripes; caudal fin including filament, reddish, its median rays yellowish; pelvic fins pink; pectoral fins translucent.

Fig. 75

Geographical Distribution: West Pacific, including the South China Sea, Strait of Malacca, southern coasts of Sumatra and Java, northern Australia, and the Gulf of Papua, to the Solomon Islands (Fig. 75).

Habitat and Biology: A benthic species, found on sand or mud bottoms in depths between 12 and 70 m. Occurs in groups and feeds on small bottom-living animals.

Size: Maximum size is 15 cm SL, commonly 13 cm SL.

Interest to Fisheries: Commonly taken by trawlers in the South China Sea. This species is taken in small quantities (usually less than 1 kg per haul in South China Sea) along with other species. Regarded as a trash fish and used mainly for fish meal or animal feed.

Local Names: PHILIPPINES: Bisugo (Tagalog), Bak-ay (Visayan) JAPAN: Yume-itoyori. MALAYSIA: Kerisi.

Literature: Fischer & Whitehead (1974, as ***N. mesoprion***); Kyushin et al. (1982); Tan et al. (1982); Gloerfelt-Tarp & Kailola (1984); Sainsbury et al. (1984).

Remarks: This species has previously been confused with ***N. mesoprion***, and the name ***N. marginatus*** has been misapplied to another species. ***N. mesoprion*** closely resembles ***N. marginatus*** in colour pattern, but lacks the filamentous extension to the upper lobe of the caudal fin; the posterior margin of the suborbital is more or less straight, rather than evenly curved; and the upper stripe on the body is not divided anteriorly.

Nemipterus mesoprion (Bleeker, 1853) | Fig. 76, Plate II, d | **NEMIP Nem 6**

Dentex mesoprion Bleeker, 1853a, Nat. Tijdschr. Ned.-Indië, 4: 255 (Priaman, Sumatra).

Synonyms: None.

FAO Names: En - Mauvelip threadfin bream.

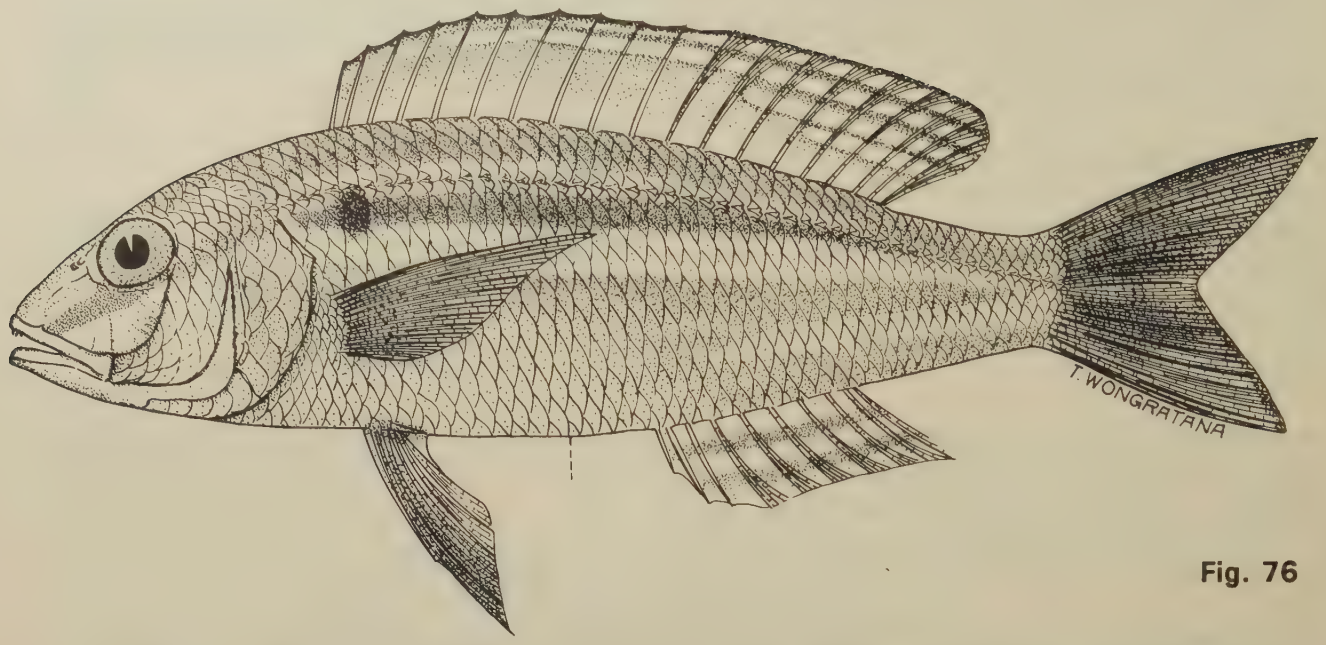


Fig. 76

Diagnostic Features: Body depth 3.3 to 3.8 in SL; snout length greater than diameter of eye; diameter of eye 3.4 to 4.1 in head length; lower margin of eye above a line from tip of snout to upper base of pectoral fin; interorbital width 1.6 to 1.9 in eye; suborbital depth 1.1 to 1.6 in eye diameter; a line drawn up from the posterior edge of suborbital reaching the dorsal profile about 4 to 7 scale rows before origin of dorsal fin; preopercle naked width 1.4 to 1.7 in scaly width; pectoral and pelvic, fins long, reaching to between level of anus and origin of anal fin; pectoral fins 1.1 to 1.5 in head length, pelvic fins 1.1 to 1.4 in head length; caudal fin forked; 4 or 5 pair of small recurved canines anteriorly in upper jaw; gill rakers 11 to 14. **Colour:** upper part of head and body pinkish, silvery white below; head with oblique golden yellow stripe from beneath eye to middle of upper jaw, and less distinct oblique yellow stripe from anterior of eye to near tip of snout; interspace between these stripes pinkish mauve (becomes dusky in alcohol); upper lip pale mauve; opercle with golden reflections; back with indistinct golden stripe beneath dorsal fin; red shoulder spot beneath third to fifth lateral-line scales; golden stripe beneath lateral line extending from shoulder spot to upper caudal base; golden stripe, broader and tapering posteriorly, from base of pectoral fin to midcaudal base; spinous dorsal fin with red margin, soft-rayed part of fin with yellow margin, base of fin pale mauve; anterior part of dorsal fin with broad pale yellow stripe, this dividing into 3 or 4 narrow yellow stripes posteriorly; anal fin pale bluish white, with two yellow stripes; caudal fin pinkish, upper and lower margins tinged yellowish; pectoral fins pale pink; pelvic fins with first two rays pink, inner rays hyaline.

Geographical Distribution: Known from southern Indonesia and the Gulf of Thailand (Fig. 77).

Fig. 77

Habitat and Biology: A benthic species. Little is known of the habits of this species.

Size: Maximum size is 14 cm SL, commonly 13 cm SL.

Interest to Fisheries: Taken by handline and bottom trawl, together with other species.

Literature: Gloerfelt-Tarp & Kailola (1984, fig. as ***N. metopias***).

Remarks: ***N. mesoprion*** has been confused with ***N. marginatus***. The two species are very similarly coloured, but ***N. mesoprion*** may be distinguished by the absence of a caudal filament, a more or less straight posterior suborbital margin, absence of a pale silvery mauve streak behind the red shoulder spot, and the middle caudal rays not contrasted yellow when fresh.

Nemipterus nematophorus (Bleeker, 1853)	Fig. 78, Plate II, e	**NEMIP Nem 8**

Nemipterus nematophorus Bleeker, 1853d, Nat. Tijdschr. Ned.-Indië, 5: 500 (Padang, Sumatra).

Synonyms: ***Dentex filamentosus*** Valenciennes in C. & V. (1830b) (name preoccupied by ***Cantharus filamentosus*** Rüppell); ***Synagris macronemus*** Günther (1859) (replacement name for ***D. filamentosus***).

FAO Names: En - Doublewhip threadfin bream.

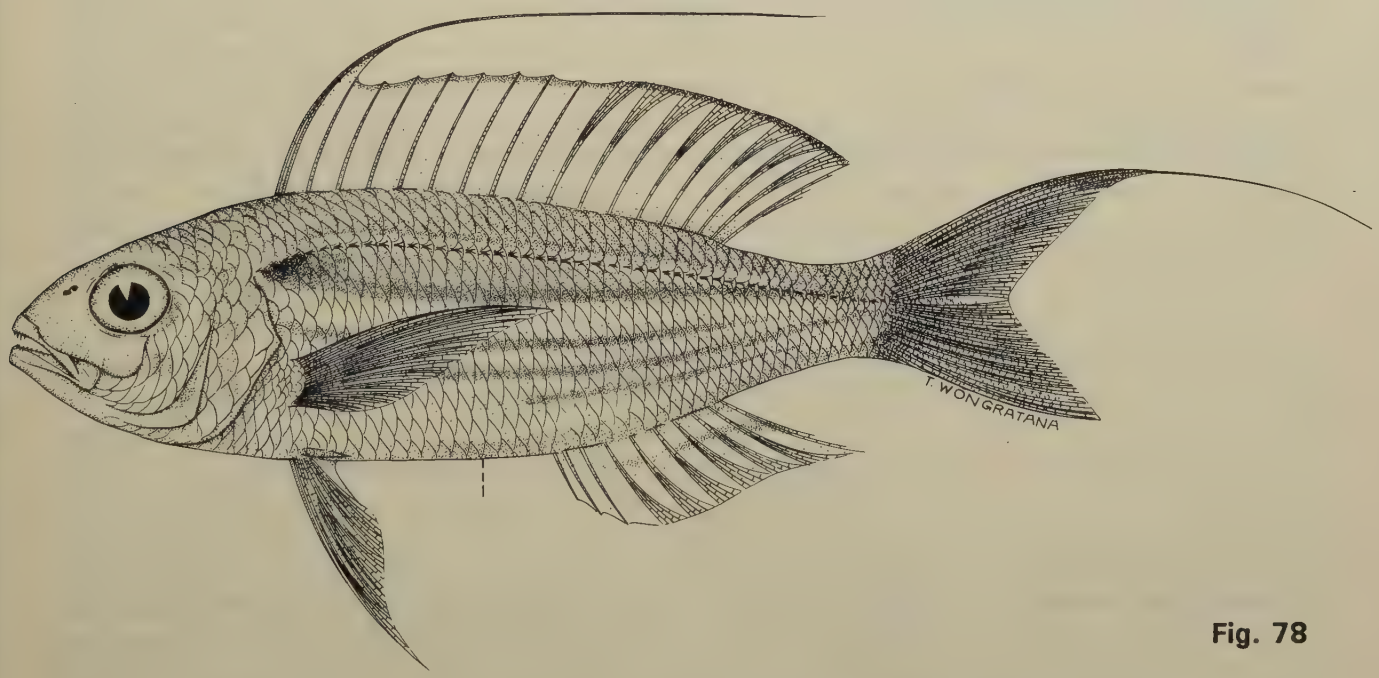


Fig. 78

Diagnostic Features: Body depth 2.9 to 3.5 in SL; snout length about equal to or greater than diameter of eye; diameter of eye 3.0 to 4.0 in head length; lower margin of eye tangent to a line from tip of snout to upper base of pectoral fin; interorbital width 0.8 to 1.8 in eye; suborbital depth 1.4 to 2.6 in eye diameter; a line drawn up from the posterior edge of suborbital reaching the dorsal profile about 2 to 5 scale rows before origin of dorsal fin; preopercle naked width 1.3 to 1.9 in scaly width; dorsal fin with anterior pair of spinous rays close together, almost fused and produced into a long, trailing filament; pectoral and pelvic fins

long, reaching to between level of anus and origin of anal fin; pectoral fins 0.9 to 1.1 in head length, pelvic fins 0.9 to 1.5 in head length; caudal fin forked, upper lobe produced into a trailing filament; 3 to 5 pair of small recurved canines anteriorly in upper jaw; gill rakers 12 to 15. **Colour**: upper part of head and body pinkish, silvery-white below; broad golden-yellow stripe beneath lateral line, with distinct gold patch anteriorly beneath origin of lateral line; 3 narrow golden-yellow stripes laterally along ventral half of the body; yellow stripe on either side of ventral midline; dorsal fin translucent pinkish, anterior dorsal filament and margin of fin yellow; anal fin translucent, faint yellow or orange stripe along fin extending from near base of first spine to middle of last ray, basal part of fin pale bluish-white; caudal fin pink, upper tip and caudal filament yellow; pectoral fins pale pink; pelvic fins pink, axillary scale lemon-yellow.

Geographical Distribution: Indo-West Pacific, including the Bay of Bengal, Andaman Sea, Strait of Malacca, Philippines, South China Sea, Gulf of Thailand and Indonesia. Record of this species from northwestern Australia by Allen & Swainston (1988) is apparently without basis (Fig. 79).

Fig. 79

Habitat and Biology: A benthic species, occurs on sand or mud bottoms in depths down to 75 m.

Size: Maximum size is 20 cm SL, commonly 15 cm SL.

Interest to Fisheries: Taken by gill net and bottom trawl. In East Malaysian waters highest catches occur in depths of more than 50 m. Appears occasionally in local markets. No major fishery exists.

Local Names: PHILIPPINES: Lagao.

Literature: Fisher & Whitehead (1974); Rao & Rau (1980); Fischer & Bianchi (1984); Gloerfelt-Tarp & Kailola (1984).

Nemipterus nematopus (Bleeker, 1851) | Fig. 80, Plate II, f | **NEMIP Nem 21**

Dentex nematopus Bleeker, 1851b, Nat. Tijdschr. Ned.-Indië, 2: 219 (Bulucomba, Celebes).

Synonyms: ***Dentex sumbawensis*** Bleeker (1859).

FAO Names: En - Yellow-tipped threadfin bream.

Fig. 80

Diagnostic Features: Body depth 3.1 to 4.0 in SL; snout length a little less or a little more than diameter of eye; diameter of eye 2.9 to 3.7 in head length; lower margin of eye tangent to or above a line from tip of snout to upper base of pectoral fin; interorbital width 1.3 to 2.1 in eye; suborbital depth 1.6 to 3.0 in eye diameter; a line drawn up from the posterior edge of suborbital reaching the dorsal profile about 2 to 6 scale rows before origin of dorsal fin; preopercle naked width 1.5 to 2.3 in scaly width; pectoral fins long, reaching to or just short of level of origin of anal fin, 1.0 to 1.3 in head length; pelvic fins long, reaching to or just beyond level of origin of anal fin, 0.9 to 1.1 in head length; caudal fin forked, upper lobe pointed; 4 pair of small recurved canines anteriorly in upper jaw; gill rakers 13 to 16. **Colour:** head and body pinkish, with mauve reflections, paling to pearly-white on ventral half; indefinite pale mauve stripe along lateral line; two distinctive sulphur-yellow stripes beneath lateral line; first stripe from below origin of lateral line and extending horizontally to upper caudal-fin base; second stripe from above pectoral base, descending slightly and extending midlaterally to middle of caudal-fin base; 1 or 2 less distinct, narrower, yellow stripes present beneath midlateral stripe; pale yellow stripe on either side of ventral midline from isthmus to caudal-fin base; dorsal fin translucent, with narrow yellow margin and 3 narrow yellow stripes (smaller specimens with 2 stripes, a lower third stripe sometimes forming posteriorly on fin; larger specimens with a lower fourth stripe posteriorly); anal fin translucent, without stripes; pelvic fins pale whitish, anteriormost spine and axillary scale yellow; pectoral fins translucent pink; caudal fin pinkish, upper tip bright sulphur-yellow.

Geographical Distribution: Philippines, Indonesia, northern Australia from the Timor Sea to northern Queensland (Fig. 81).

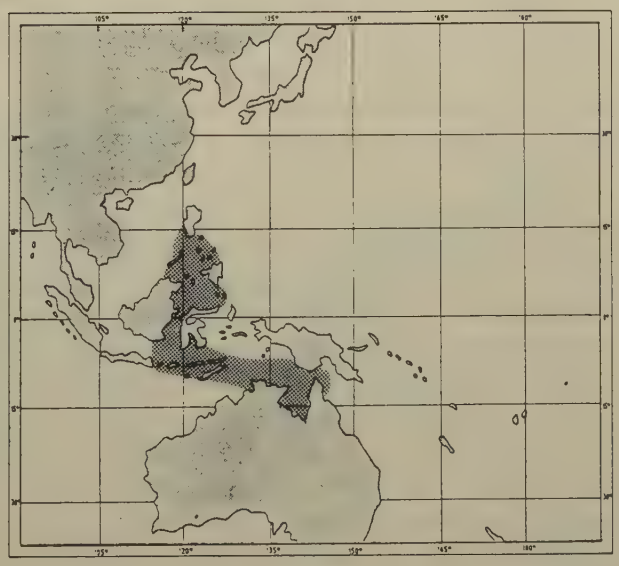


Fig. 81

Habitat and Biology: A benthic species, occurs on sand or mud bottoms in depths of 30 to 102 m.

Size: Maximum size is 17.5 cm SL, commonly 15 cm SL.

Interest to Fisheries: Taken by handline and bottom trawl together with other species. Appears in small numbers in local markets. No major fishery exists.

Local Names: AUSTRALIA: Yellow-tipped threadfin-bream.

Literature: Gloerfelt-Tarp & Kailola (1984); Sainsbury et al. (1984); Allen & Swainston (1988).

Remarks: This species has been previously confused with ***N. marginatus*** by some authors.

Nemipterus nemurus (Bleeker, 1857) Fig. 82, Plate II, g **NEMIP Nem 9**

Dentex nemurus Bleeker, 1857, Act. Soc. Sc. Indo-Neerl., 2: 49 (Amboina).

Synonyms: None.

FAO Names: En - Redspine threadfin bream.

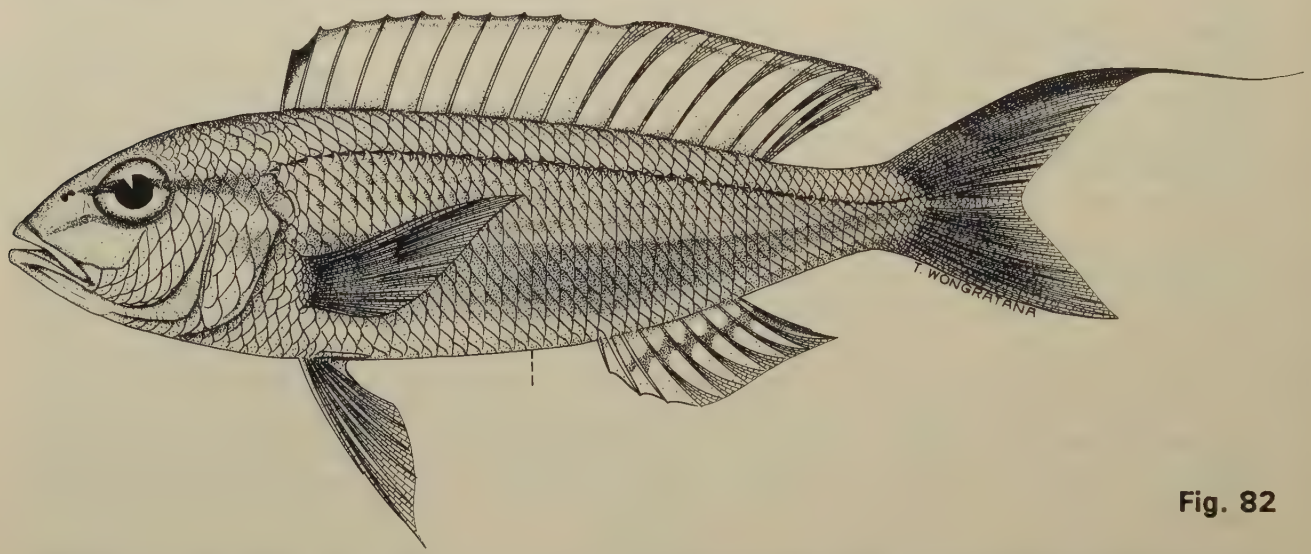


Fig. 82

Diagnostic Features: Body depth 3.3 to 4.0 in SL; snout length a little more than or a little less than diameter of eye; diameter of eye 2.9 to 3.7 in head length; lower margin of eye tangent to or just above a line from tip of snout to upper base of pectoral fin; interorbital width 1.4 to 1.9 in eye; suborbital depth 2.2 to 4.7 in eye diameter; a line drawn up from the posterior edge of suborbital reaching the dorsal profile about 3 to 7 scale rows before origin of dorsal fin; preopercle naked width 1.5 to 2.2 in scaly width; pectoral and pelvic fins moderately long, reaching to or just short of level of anus; pectoral fins 1.1 to 1.3 in head length, pelvic fins 1.2 to 1.5 in head length; caudal fin forked, the upper rays produced into a trailing filament; 2 to 5 pair of small recurved canines anteriorly in upper jaw; gill rakers 12 to 13. **Colour:** body pinkish above, with indistinct, broad, pale yellow stripe from behind eye to caudal base; indistinct, narrow golden stripes along 3 scale rows below lateral line; ventral half of body pearly-white, with indistinct, broad, pale yellow stripe from behind pectoral fin to caudal base; head pinkish, with pale golden reflections on cheeks and opercle; golden yellow stripe from posterior nostril extending through eye, and similar stripe from anterior margin of upper lip to lower margin of eye; iris pink; dorsal fin pale yellow, base of fin and submargin translucent pale mauve, margin of fin yellow; interspinous membrane of first two dorsal spines bright red superiorly; anal fin white, with series of yellow spots or irregular yellow stripe submedially; caudal fin pinkish, posterior margin red; lower lobe of fin suffused with yellow, upper rays and filament yellow; pectoral fins pale yellowish pink; pelvic fins white.

Geographical Distribution: West Pacific, including the Philippines, Gulf of Thailand, South China Sea, Strait of Malacca and Indonesia (Fig. 83).

Fig. 83

Habitat and Biology: A benthic species, occurs on mud or sand bottoms. Feeds on small fishes and larger benthic invertebrates.

Size: Maximum size is 21 cm SL, commonly 17 cm SL.

Interest to Fisheries: Taken by handline and bottom trawl together with other species. The most abundant species of ***Nemipterus*** in bottom trawl catches from the South China Sea. Appears in small numbers in local markets. No major fishery exists.

Local Names: PHILIPPINES: Lambadon, Lagao, Silay, Silayan, Bisugo.

Literature: Fischer & Whitehead (1974); Rau & Rau (1980).

Nemipterus peronii (Valenciennes, 1830) | Fig. 84, Plate II, h | **NEMIP Nem 12**

Dentex Peronii Valenciennes in C. & V., 1830b, Hist. nat. poiss., 6: 245, pl. 154 (no type locality given - probably northwestern Australia).

Synonyms: ***Dentex tolu*** Valenciennes in C. & V. (1830b); ***Cantharus guliminda*** Valenciennes in C. & V. (1830b) (based on 'Lama guliminda' Russell, 1803); ***Dentex mulloides*** Bleeker (1852b); ***Dentex obtusus*** Bleeker (1860) (nomen nudum); ***Dentex (Heterognathodon) smithii*** Steindachner (1868); ***Nemipterus oveniides*** Popta (1921); ***Nemipterus sampsonensis*** Scott (1959).

FAO Names: **En** - Notchedfin threadfin bream. **Fr** - Cohana tolu. **Sp** - Baga tolu.

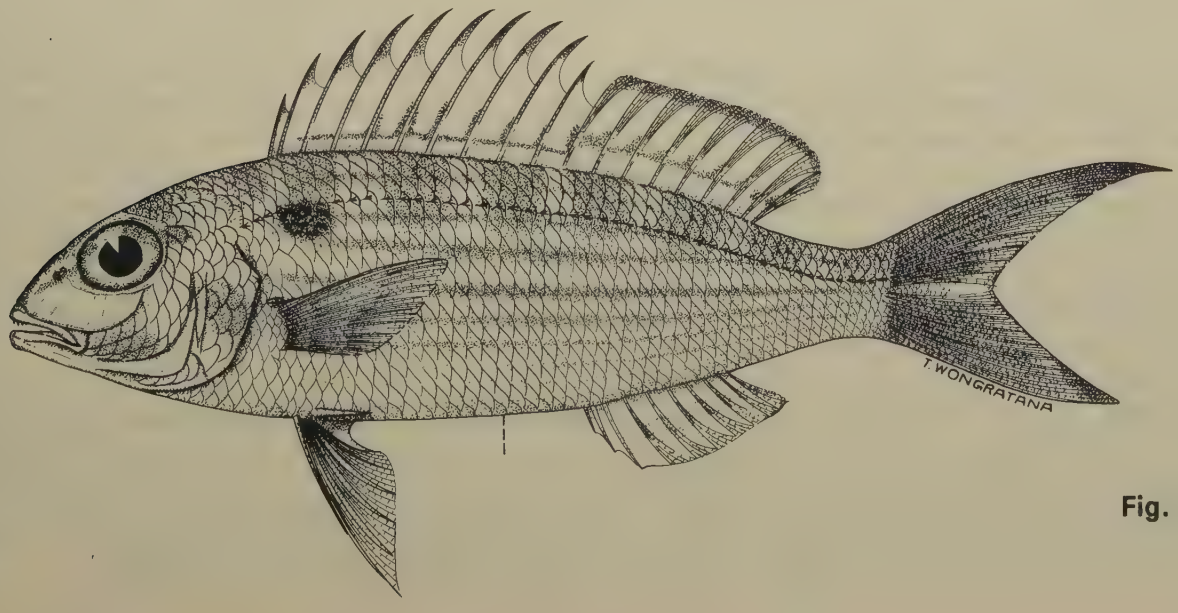


Fig. 84

Diagnostic Features: Body depth 3.1 to 4.1 in SL; snout length about equal to diameter of eye; diameter of eye 2.8 to 3.6 in head length; lower margin of eye just above a line from tip of snout to upper base of pectoral fin; interorbital width 1.4 to 1.9 in eye; suborbital depth 1.1 to 2.2 in eye diameter; a line drawn up from the posterior edge of suborbital reaching the dorsal profile at or just before origin of dorsal fin; preopercle naked width 1.5 to 2.2 in scaly width; dorsal-fin spines elongate, interspinous membrane deeply incised; pectoral fins short, 1.1 to 1.7 in head length, not reaching to level of anus; pelvic fins moderately long, 1.1 to 1.5 in head length, reaching to level of anus; caudal fin forked, upper lobe pointed and slightly longer than lower; 3 or 4 pair of small recurved canines anteriorly in upper jaw; gill rakers 9 to 12 (usually 10 to 11). **Colour**: upper part of body pinkish, with 7 or 8 indistinct darker pink saddles reaching to or just below the lateral line; lower part of body silvery, with faint golden lines following each scale row; a diffuse pale reddish spot below and just behind origin of lateral line; a golden-yellow stripe on snout in front of eye passing through nostrils; upper lip yellow; suborbital silvery-mauve; golden reflections on preopercle and opercle; dorsal fin pale whitish-pink, with a pale yellow line or series of spots just above base of fin; tips of spinous part of fin reddish-yellow; anal fin pale whitish-pink, suffused pale yellowish over its middle part; caudal fin pinkish; pelvic fins whitish, axillary scale at base yellow, pectoral fins translucent.

Geographical Distribution: West Pacific from Taiwan to northern Australia, and Indian Ocean including the Andaman Sea, Bay of Bengal, Sri Lanka, Arabian Sea, Persian Gulf and Red Sea (Fig. 85).

Fig. 85

Habitat and Biology: A benthic species, found on sand or mud bottoms in depths down to about 100 m. Size of the fish appears to increase with depth and males are relatively larger than females. Two prolonged spawning seasons are likely in the South China Sea off the Trengganu coast: from November to February, and another starting in May or June. This species is an active carnivore, feeding during daylight on fish, crustaceans, molluscs and polychaetes (Said et al., 1983).

Size: Maximum size is 26.5 cm SL, commonly 17 cm SL.

Interest to Fisheries: Taken by handline and bottom trawl along with other species of ***Nemipterus***. Appears in small numbers in local markets. Trawled in commercial quantities in the Straits of Malacca and off the Trengganu coast, South China Sea.

Local Names: AUSTRALIA: Notched threadfin-bream. PHILIPPINES: Bisugo (Tagalog), Sagisi-on (Visayan), Silay, Bakag, Bisugong maylawi. MALAYSIA: Kerisi. SRI LANKA: Kunda (Sinhalese), Kundan, Kundi (Tamil). JAPAN: Shamu-itoyori. BAHRAIN: Bassi, Bassij. KUWAIT: Bassi. INDONESIA: Jamban, Krisi. THAILAND: Pla Sai Dang. PAKISTAN: Katti (Sindhi), Kolonto (Baluchi).

Literature: The following have reported this species as ***N. tolu***: Kuronuma & Abe (1972); Fischer & Whitehead (1974); Randall et al. (1978); Rau & Rau (1980); Schroeder (1980); Kyushin et al. (1982); Tan et al. (1982); Kuronuma & Abe (1986). It is correctly named by Fischer & Bianchi (1984); Bianchi (1985b); Gloerfelt-Tarp & Kailola (1984); Sainsbury et al. (1984); Al-Baharna (1986); Smith & Heemstra (1986); Allen & Swainston (1988).

Remarks: This species has previously been referred to as ***N. tolu*** by many authors, and the name ***N. peronii*** has been misapplied to ***N. furcosus***. ***N. tolu*** is a junior synonym of ***N. peronii***.

Nemipterus randalli Russell, 1986	Fig. 86, Plate III, a	**NEMIP Nem 22**

Nemipterus randalli Russell, 1986a, Senckenberg. Biol., 67: 23, fig. 2 (Persian Gulf; Red Sea; Gulf of Aden; Zanzibar; Seychelles; Madagascar; Pakistan; India).

Synonyms: None.

FAO Names: **En** - Randall's threadfin bream.

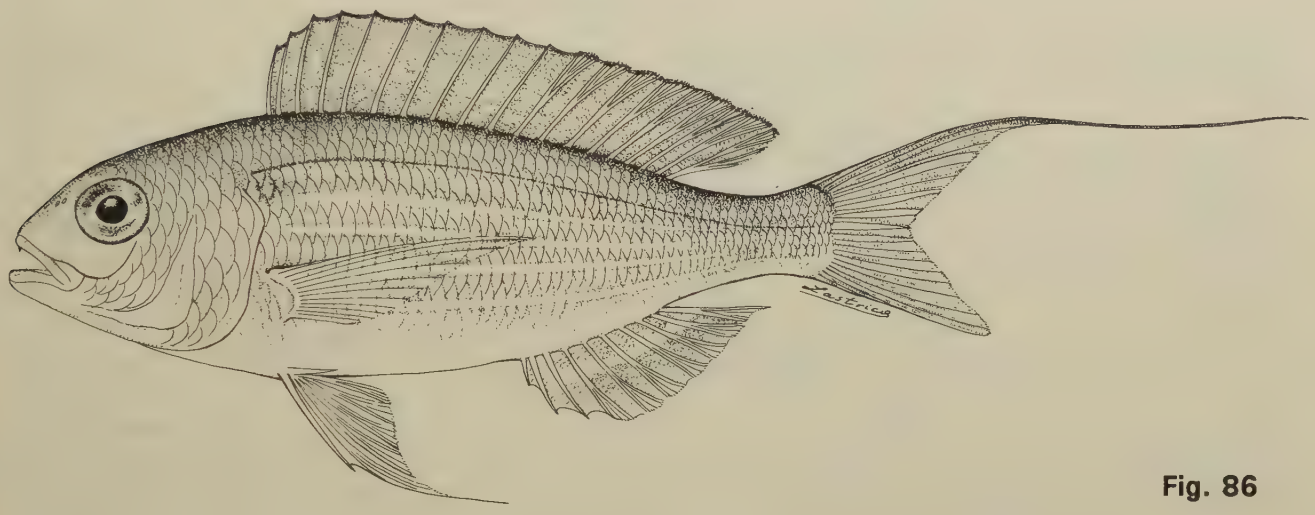


Fig. 86

Diagnostic Features: Body depth 2.9 to 3.5 in SL; snout length about equal to diameter of eye; diameter of eye 2.7 to 3.7 in head length; lower margin of eye tangent to or just above a line from tip of snout to upper base of pectoral fin; interorbital width 1.4 to 2.0 in eye; suborbital depth 1.7 to 4.0 in eye diameter; a line drawn up from the posterior edge of suborbital reaching the dorsal profile about 3 to 7 scale rows before origin of dorsal fin; preopercle naked width 1.2 to 3.0 in scaly width; pectoral and pelvic fins very long, reaching to or just beyond level of origin of anal fin; pectoral fins 1.0 to 1.4 in head length, pelvic fins 0.9 to 1.4 in head length; caudal fin forked, upper rays produced into a long trailing filament; 3 to 4 pair of small recurved canines anteriorly in upper jaw; gill rakers 12 to 15. **Colour**: body silvery-pink with 3 or 4 faint yellow stripes on sides below lateral line; broad yellow stripe on either side of ventral midline; pinkish blotch below origin of lateral line; eye salmon pink; dorsal fin pale bluish, with closely packed yellow-pigmented markings on the lower three fourths of the fin; upper margin of dorsal fin edged with red; anal fin pale bluish with narrow yellow medial stripe; caudal fin pink, caudal filament light reddish; pelvic fins whitish; pectoral fins transparent; peritoneum salmon-pink.

Geographical Distribution: Western Indian Ocean, including the east and west coast of India, Pakistan, Persian Gulf, Red Sea, Gulf of Aden, east African coast, Seychelles and Madagascar (Fig. 87).

Fig. 87

Habitat and Biology: A benthic species, occurs on sand or mud bottoms in depths of 22 to 225 m. In Indian waters off Kakinada, this species apparently spawns during December to April, with a peak in January (Murty, 1981, as ***N. mesoprion***).

Estimates of the parameters of the von Bertalanffy growth curve made for the population from Kakinada, India (Murty, 1981) are: L_∞ = 21.9 cm TL, K = 0.83, t_0 = - 0.26.

Size: Maximum size is 18.5 cm SL, commonly 15 cm SL.

Interest to Fisheries: Taken by handline and bottom trawl. Appears in local markets. No major fishery exists, but a large population is believed to occur in the Persian Gulf (Kuronuma & Abe, 1986).

Literature: Russell (1986a), Kuronuma & Abe (1986, as ***N. mesoprion***).

Remarks: This recently described species has been previously misidentified as ***N. mesoprion***.

Nemipterus sp. 1 | Fig. 88, Plate III, b | **NEMIP Nem 23**

Undescribed species

Synonyms: None.

FAO Names: En - Bluecheek threadfin bream.

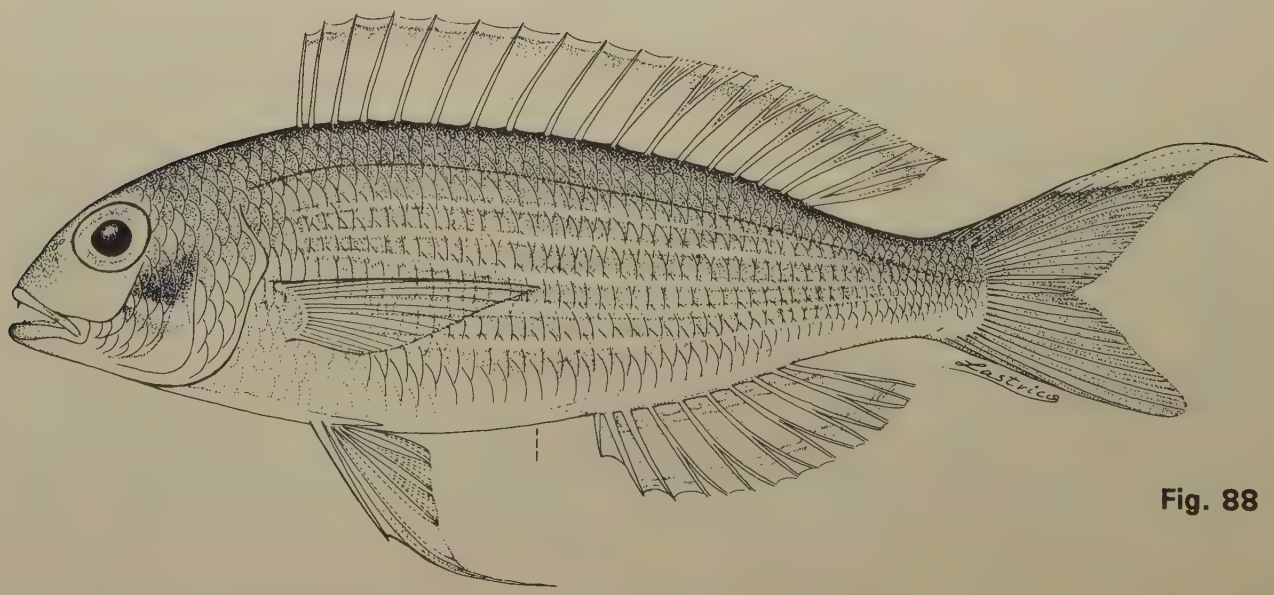


Fig. 88

Diagnostic Features: Body depth 3.2 to 3.5 in SL; snout length about equal to or greater than diameter of eye; diameter of eye 3.1 to 4.0 in head length; lower margin of eye just above a line from tip of snout to upper base of pectoral fin; interorbital width 1.2 to 1.9 in eye; suborbital depth 1.2 to 2.3 in eye diameter; a line drawn up from the posterior edge of suborbital reaching the dorsal profile about 3 to 7 scale rows before origin of dorsal fin; preopercle naked width 1.3 to 1.7 in scaly width; pectoral fins moderately long, 1.1 to 1.3 in head length, reaching to or just beyond level of anus; pelvic fins very long, 1.1 to 1.4 in head length, reaching to or just beyond level of origin of anal fin; caudal fin forked, upper rays prolonged and pointed, but not forming a filament; 3 or 4 pair of small recurved canines anteriorly in upper jaw; gill rakers 11 to 13. **Colour**: body silvery pink with bluish iridescent tinges, darker above; 5 pale golden-yellow stripes on sides beneath lateral line; ventral surface silvery-white with broad lemon-yellow stripe on either side of ventral midline; head with golden iridescent reflections; ovoid-shaped, pinkish-mauve blotch extending from beneath eye to upper part of opercle; eye pinkish-silver; upper lip yellow anteriorly; dorsal fin pale pink, with broad yellow margin, edged below by red; greyish mauve submarginal stripe on posterior half of fin; anal fin translucent pinkish, with reddish margin and narrow yellow submarginal stripe; narrow yellow stripe just above base of anal fin, extending to tip of last anal-fin ray; caudal fin pink, upper tip yellow; pelvic fins pinkish, with bright yellow stripe along second ray from base to tip of fin; pectoral fins pinkish; peritoneum silvery-white.

Geographical Distribution: So far known only from Indonesia: southern coasts of eastern Java, Bali, Lombok (Fig. 89).

Habitat and Biology: A benthic species, occurs in depths of 65 to 125 m.

Size: Maximum size is 26 cm SL, commonly 15 cm SL.

Interest to Fisheries: Taken so far only by exploratory bottom trawling. Not seen in local markets. No major fishery exists.

Literature: Gloerfelt-Tarp & Kailola (1984, as ***N. virgatus*** and figured as ***N. tambuloides***); Allen & Swainston (1988, as ***N.* sp.**).

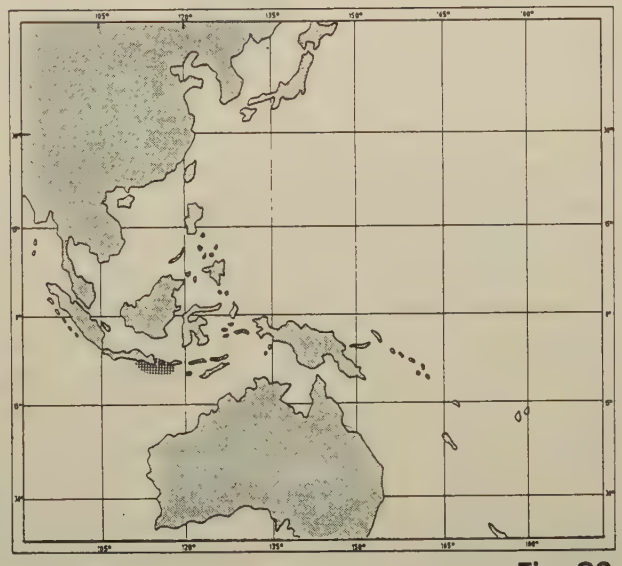


Fig. 89

Remarks: This undescribed species is easily confused with ***N. virgatus***, under which name it may have been misidentified in the past.

***Nemipterus* sp. 2** | Fig. 90, Plate III, c | **NEMIP Nem 5**

Undescribed species

Synonyms: None.

FAO Names: **En** - Palefin threadfin bream.

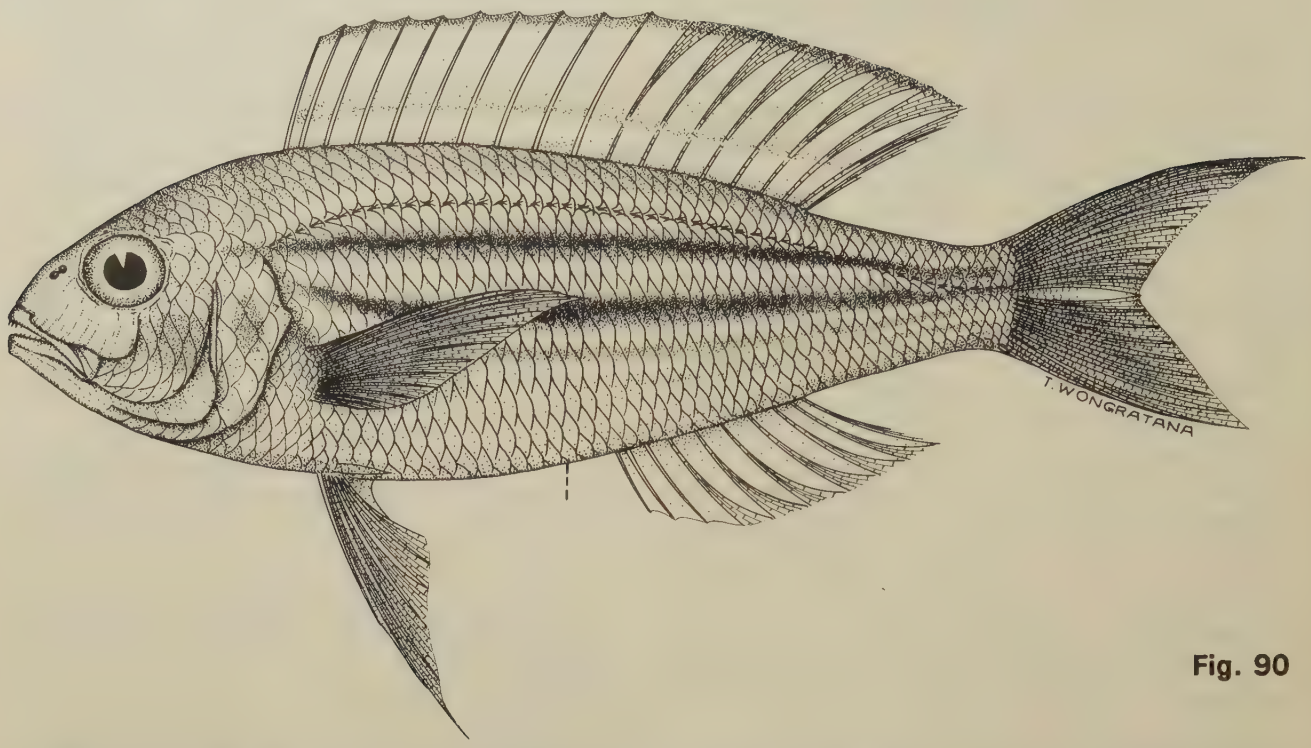


Fig. 90

Diagnostic Features: Body depth 2.8 to 3.4 in SL; snout length about equal to or greater than diameter of eye; diameter of eye 2.9 to 4.3 in head length; lower margin of eye tangent to or just above a line from tip of snout to upper base of pectoral fin; interorbital width 0.9 to 1.8 in eye; suborbital depth 1.1 to 2.1 in eye diameter; a line drawn up from the posterior edge of suborbital reaching the dorsal profile about 3 to 7 scale rows before origin of dorsal fin; preopercle naked width 1.1 to 1.6 in scaly width; pectoral and pelvic fins long, reaching to or just short of level of origin of anal fin; pectoral fins 0.9 to 1.1 in head length, pelvic fins 1.0 to 1.2 in head length; caudal fin forked, upper rays prolonged and pointed, but not forming a filament; 3 or 4 pair of small recurved canines anteriorly in upper jaw; gill rakers 13 to 16. **Colour:** body pinkish, silvery below; two narrow golden-yellow stripes on sides; the first from above upper preopercle margin to upper caudal-fin base; the second from behind upper opercle margin, curving downwards slightly and extending to middle of caudal-fin base; cheeks and opercle tinged with bluish-gold; dorsal fin pale pinkish-yellow, with bright yellow margin and pale dusky submarginal stripe; caudal pinkish, upper tip bright yellow; anal fin translucent whitish; pelvic fins translucent whitish, yellow stripe extending down second soft ray, axillary scale yellow; pectoral fins pale pink.

Geographical Distribution: West Pacific, including southern Japan, Gulf of Thailand, South China Sea, Strait of Malacca, Indonesia (Fig. 91).

Habitat and Biology: A benthic species, occurs on sand or mud bottoms in depths of about 60 to 80 m.

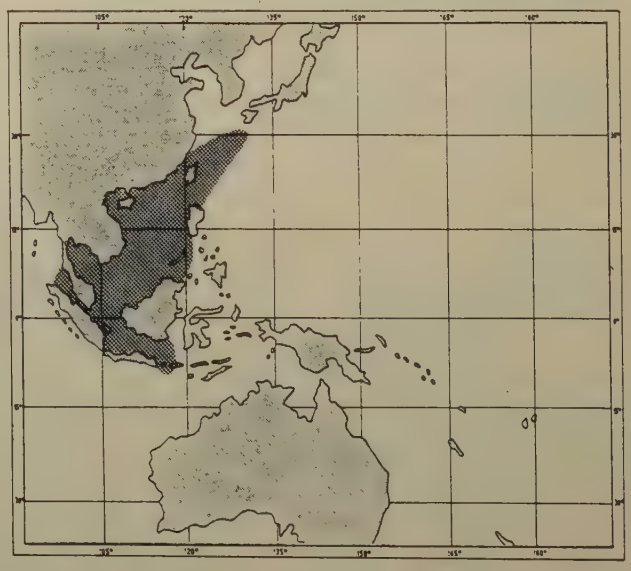


Fig. 91

Estimates of asymptotic length (L_∞), asymptotic weight (W_∞), coefficient of growth (K), and rate of natural mortality made for the population off Kalimantan in the South China Sea (Pauly & Martosubroto, 1980, as ***N. marginatus***) are: L_∞ = 24.5 cm TL, W_∞ = 210 g, K = 0.42, M = 1.73.

Size: Maximum size is 21.5 cm SL, commonly 16 cm SL.

Interest to Fisheries: Taken by handline and bottom trawl. This species constitutes about 20% of the total nemipterid catch in the South China Sea off Kalimantan, but catch rates are low (about 3.5 kg/hour at 45 m depth). No major fishery exists.

Local Names: PHILIPPINES: Silay, Bakag, Bisugo, Bisugong maylawi.

Literature: Fischer & Whitehead (1974, as ***N. marginatus***); Rau & Rau (1980, as ***N. marginatus***); Gloerfelt-Tarp & Kailola (1984, as ***N.* sp 3**).

Remarks: This undescribed species has been previously misidentified as ***N. marginatus*** by most authors.

***Nemipterus* sp. 3**	Fig. 92, Plate III, d	**NEMIP Nem 24**

Undescribed species

Synonyms: None.

FAO Names: **En** - Dawn threadfin bream.

Fig. 92

Diagnostic Features: Body depth 3.2 to 3.9 in SL; snout length equal to or a little more than diameter of eye; diameter of eye 2.9 to 3.7 in head length; lower margin of eye tangent to or above a line from tip of snout to upper base of pectoral fin; interorbital width 1.2 to 1.8 in eye; suborbital depth 1.1 to 2.0 in eye diameter; a line drawn up from the posterior edge of suborbital reaching the dorsal profile somewhere between 2 scale rows before origin of dorsal fin and third dorsal spine; preopercle naked width 1.2 to 1.7 in scaly width; pectoral fins

moderately long, 1.1 to 1.4 in head length, reaching to or just beyond level of anus; pelvic fins very long, 0.9 to 1.3 in head length, reaching to just before level of origin of anal fin and third anal spine; caudal fin forked, tips of fin pointed or slightly rounded; scale rows on body below lateral line upward-curved anteriorly; 3 pair of small recurved canines anteriorly in upper jaw; gill rakers 11 to 14. **Colour**: body pinkish above, shading through pale mauve to silvery on ventral half; sides with 4 or 5 longitudinal, upward-curved silvery-white stripes along the middle of each scale row below lateral line, from behind head to caudal peduncle; head pinkish with golden-yellow reflections on opercle; upper lip with yellow edge; dorsal fin pale translucent yellow, with lemon-yellow margin and pale mauve submarginal stripe; broad bicoloured submedial stripe, yellow above orange below, becoming uniformly yellow posteriorly; anal fin transparent, with pale lemon submedial stripe (sometimes broken) above base of fin; caudal fin yellowish pink, upper tip rosy; pelvic and pectoral fins transparent.

Geographical Distribution: West Pacific from the Ryukyu Islands to southeastern Indonesia (Fig. 93).

Habitat and Biology: A benthic species, found on sand or mud bottoms in depths of 56 to 90 m.

Size: Maximum size is 20 cm SL, commonly 15 cm SL.

Interest to Fisheries: Taken in commercial trawls in the South China Sea and southern Gulf of Thailand together with other species of ***Nemipterus***. No major fishery exists.

Fig. 93

Local Names: JAPAN: Hira-itoyori.

Literature: The following have reported this species as ***N. delagoae***: Masuda et al. (1975, 1984); Shen (1984); Lee (1986).

Remarks: This undescribed species has been previously misidentified as ***N. delagoae*** (= ***N. bipunctatus***), a species which it closely resembles but which is restricted to the Indian Ocean.

Nemipterus tambuloides (Bleeker, 1853)	Fig. 94, Plate III, e	**NEMIP Nem 11**

Dentex tambuloides Bleeker, 1853b, Nat. Tijdschr. Ned.-Indië, 4: 465 (Batavia, Java).

Synonyms: ***Nemipterus pentalinea*** Wongratana (1974) (nomen nudum).

FAO Names: En - Fivelined threadfin bream.

Fig. 94

Diagnostic Features: Body depth 3.2 to 3.6 in SL; snout length equal to or greater than diameter of eye; diameter of eye 3.2 to 4.1 in head length; lower margin of eye tangent to or just above a line from tip of snout to upper base of pectoral fin; interorbital width 1.5 to 1.9 in eye; suborbital depth 1.3 to 1.8 in eye diameter; a line drawn up from the posterior edge of suborbital reaching the dorsal profile about 2 to 7 scale rows before origin of dorsal fin; preopercle naked width 1.8 to 2.4 in scaly width; pectoral and pelvic fins long, reaching to between level of anus and origin of anal fin; pectoral fins 1.0 to 1.1 in head length, pelvic fins 1.1 to 1.4 in head length; caudal fin forked, upper lobe pointed; 3 or 4 pair of small recurved canines anteriorly in upper jaw; gill rakers 12 to 14. **Colour**: upper part of head and body rosy, paling to silvery-white on ventral surface; 5 well-defined sulphur-yellow stripes along body; the first of these beginning above lateral line and extending along scale row to posterior of dorsal fin; second stripe running from snout through eye, postorbital part of head, and then extending as a more or less straight line to upper caudal fin base; remaining stripes beginning behind head and following each scale row, slightly ascending posteriorly; sulphur-yellow stripe along either side of ventral midline from isthmus to lower caudal-fin base; head with two yellow stripes beneath eye; cheeks and opercle with golden and mauve reflections; dorsal fin translucent pink, with yellow margin and bluish grey inframarginal stripe; narrow sulphur-yellow stripe extending just above base of dorsal fin; anal fin translucent bluish-white with pale yellow stripe near base of fin, this stripe bent posteriorly and extending out to tip of last anal ray; caudal fin bright rosy, upper tip sulphur-yellow; pectoral fins pale pink; pelvic fins pale yellowish, spine and first ray bluish-grey.

Geographical Distribution: Andaman Sea, Strait of Malacca, Philippines, Gulf of Thailand, South China Sea, Indonesia (Fig. 95).

Habitat and Biology: A benthic species, occurs on sand or mud bottoms in depths of 50 to 70 m.

Fig. 95

Size: Maximum size is 23 cm SL, commonly 18 cm.

Interest to Fisheries: Taken by handline and bottom trawl. An abundant species in Thailand, landed in large quantities throughout the year.

Literature: Gloerfelt-Tarp & Kailola (1984, fig. as ***N. virgatus***).

Nemipterus theodorei Ogilby, 1916 | Fig. 96, Plate III, f | **NEMIP Nem 25**

Nemipterus theodorei Ogilby, 1916, Proc. Roy. Soc. Qld, 28: 113 (Caloundra Banks, Queensland).

Synonyms: None.

FAO Names: En - Theodore's threadfin bream.

(from Ogilby)

Fig. 96

Diagnostic Features: Body depth 3.0 to 3.5 in SL; snout length about equal to or greater than diameter of eye; diameter of eye 3.1 to 4.2 in head length; lower margin of eye above a line from tip of snout to upper base of pectoral fin; interorbital width 1.2 to 1.6 in eye; suborbital depth 0.9 to 1.9 in eye diameter; a line drawn up from the posterior edge of suborbital reaching the dorsal profile at about or behind origin of dorsal fin; preopercle naked width 1.0 to 1.6 in scaly width; pectoral fins long, 1.0 to 1.2 in head length, reaching to or almost to level of origin of anal fin; pelvic fins very long, 1.0 to 1.4 in head length, reaching to or beyond level of origin of anal fin; caudal fin forked; scale rows on body below lateral line upward-curved anteriorly; 3 or 4 pair of small recurved canines anteriorly in upper jaw; gill rakers 12 to 13. **Colour:** body pinkish-mauve on upper half, paling to pearly-white on ventral surface; 5 or 6 greenish-yellow stripes on sides below lateral line; a red spot beneath origin of lateral line; top of head tinged with lavender, a purple stripe curving from lower edge of eye to upper lip; upper lip yellow; cheeks and opercle tinged golden; an indistinct bluish-grey spot on upper part of opercle; iris scarlet, its upper one fourth green; dorsal fin pale yellow, pink near base; two narrow, mauve submarginal stripes, bordered above and below by golden-yellow, along fin; caudal fin pinkish-yellow, upper lobe with dusky tip; anal fin translucent silvery-white, with broken pale yellow stripes along medial part of fin; pectorals and pelvic fins transparent.

Geographical Distribution: Eastern Australia from north Queensland to New South Wales (Fig. 97).

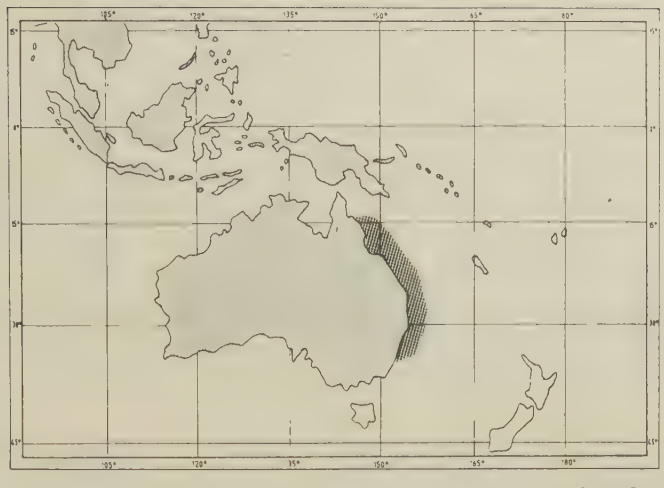


Fig. 97

Habitat and Biology: A benthic species, occurs on sand or mud bottoms in depths of 19 to 410 m.

Size: Maximum size is 20 cm SL, commonly 18 cm SL.

Interest to Fisheries: Taken by handline and bottom trawl. No major fishery exists.

Local Names: AUSTRALIA: Theodore's butterfly bream.

Literature: Ogilby (1918).

Nemipterus virgatus (Houttuyn, 1782) | Fig. 98, Plate III, g | **NEMIP Nem 13**

Sparus virgatus Houttuyn, 1782, Verh. Holland. Maatsch. Wet. Haarlem, 20: 323 (Japan).

Synonyms: ***Sparus sinensis*** Lacépède (1802); ***Dentex setigerus*** Valenciennes in C. & V. (1830b); ***Nemipterus matsubarae*** Jordan & Evermann (1902).

FAO Names: **En** - Golden threadfin bream.

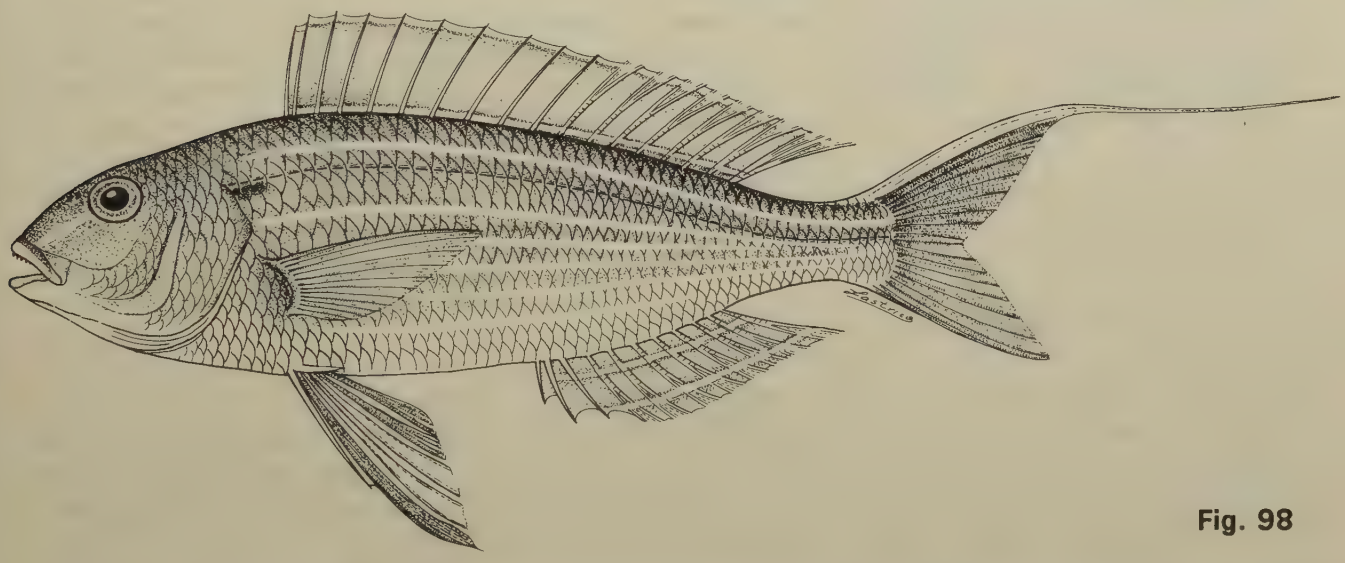


Fig. 98

Diagnostic Features: Body depth 3.2 to 4.0 in SL; snout length greater than diameter of eye; diameter of eye 3.4 to 4.3 in head length; lower margin of eye above a line from tip of snout to upper base of pectoral fin; interorbital width 1.4 to 2.1 in eye; suborbital depth 1.0 to 1.7 in eye diameter; a line drawn up from the posterior edge of suborbital reaching the dorsal profile 5 to 7 scale rows before origin of dorsal fin; preopercle naked width 1.1 to 2.0 in scaly width; pectoral and pelvic fins long, reaching to between level of anus and origin of anal fin; pectoral fins 1.0 to 1.2 in head length, pelvic fins 1.0 to 2.5 in head length; caudal fin moderately forked, upper lobe produced into trailing filament; 3 or 4 pair of small recurved

canines anteriorly in upper jaw; gill rakers 12 to 16. **Colour**: body pink, paler below; yellow stripe on back above lateral line; 5 yellow stripes on sides beneath lateral line, the uppermost of these stripes beginning just beneath origin of lateral line and running horizontally to upper base of caudal peduncle, the remaining stripes somewhat concave and descending anteriorly; ventral surface white; head pink, a yellow stripe from upper lip extending to anteroventral margin of eye; two faint yellow bars across cheeks sometimes present; eye pinkish; upper lip yellow; dorsal fin pale pink, with broad yellow margin, edged below by red anteriorly; a yellow stripe just above base of dorsal fin; anal fin translucent pinkish with yellow submarginal stripe, and narrow yellow stripe just above base of fin, this extending to tip of last anal-fin ray; caudal fin pink, upper margin of fin and filament yellow; pelvic fins pinkish, with yellow stripe along second and third rays; pectoral fins translucent pinkish.

Geographical Distribution: Southern Japan, East China Sea, northern part of South China Sea from Vietnam to Formosa Strait, northwestern Australia and Arafura Sea (Fig. 99).

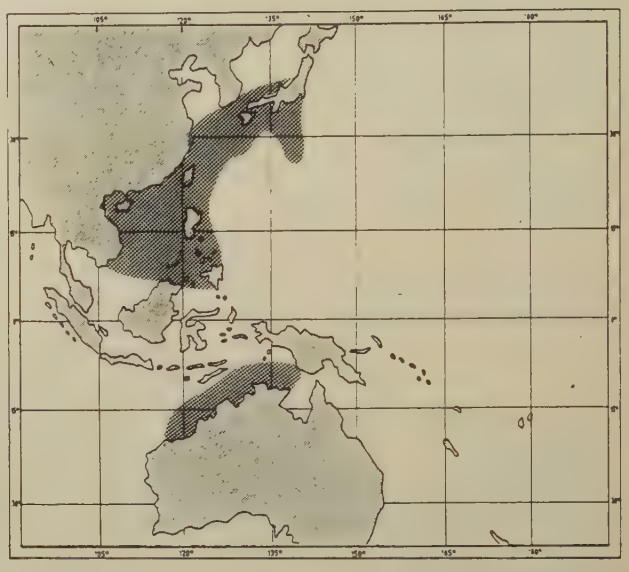


Fig. 99

Habitat and Biology: A benthic species, occurs on mud or sand bottoms in depths down to about 220 m. Very abundant in the northern part of the South China Sea and southern part of the East China Sea. Young fish generally occur in shallower water, between 18 and 33 m (Eggleston, 1973). Females predominate at small sizes and males at larger sizes, due to faster growth rates in males (Eggleston, 1973; Kao & Liu, 1979). This species is a rudimentary hermaphrodite, in which all males have functional testes with rudimentary ovarian portions throughout their life. Spawning takes place from February to June with a peak from February to April in the South China Sea (Eggleston, 1973; Liu & Su, 1972). Eggs and larvae are described by Aoyama & Sotogaki (1955), Renzhai & Surfen (1980) and Renzhai (1986). The diet consists of crustaceans, fish and cephalopods (Eggleston, 1973).

Estimates of the parameters of the von Bertalanffy growth curve made for the population from Hong Kong (Eggleston, 1973) are: L_∞ = 44.7 cm TL, K = 0.41, t_0 = - 0.12 (males); and L_∞ = 36.2 cm TL, K = 0.35, t_0 = - 0.71 (females).

Size: Maximum size is 35 cm SL, commonly 23 cm SL.

Interest to Fisheries: Taken in commercial quantities by handlines, longlines, and bottom trawls. Juveniles are also caught in considerable quantities by shrimp trawlers using beam trawls. ***N. virgatus*** is one of the most important commercial fish in the East China Sea and northern South China Sea (Li, 1954; Eggleston, 1973). Marketed mainly fresh, but also steamed or made into fish balls. **Local Names**: CHINA: Hung Sam.

Literature: Fischer & Whitehead (1974); Sainsbury et al. (1984); Shen (1984); Allen & Swainston (1988).

Nemipterus vitiensis Russell, 1990 | Fig. 100, Plate III, h | **NEMIP Nem 26**

Nemipterus vitiensis Russell, 1990, Beagle, Rec. Nor. Terr. Mus. Arts Sci., 7: 35 (Fiji, Vanuatu).

Synonyms: None.

FAO Names: **En** - Fiji threadfin bream.

Fig. 100

Diagnostic Features: Body depth 3.2 to 3.8 in SL; snout length greater than diameter of eye; diameter of eye 3.0 to 3.2 in head length; lower margin of eye tangent to a line from tip of snout to upper base of pectoral fin; interorbital width 1.6 to 1.8 in eye; suborbital depth 2.0 to 3.0 in eye diameter; a line drawn up from the posterior edge of suborbital reaching the dorsal profile about 3 to 7 scale rows before origin of dorsal fin; preopercle naked width 1.8 to 2.3 in scaly width; pectoral and pelvic fins moderately long, reaching to just beyond level of anus; pectoral fins 1.0 to 1.2 in head length, pelvic fins 1.3 to 1.5 in head length; caudal fin forked, upper lobe produced into a long, trailing filament; 4 pair of small recurved canines anteriorly in upper jaw; gill rakers 12 to 14. **Colour**: head and body silvery-white, dusky-blue on dorsum; indistinct yellow midlateral stripe from above pectoral fin to caudal peduncle; broad lemon-yellow stripe on either side of ventral midline; eye silvery; dorsal fin light dusky, upper margin of fin yellow-edged, with dusky-mauve submarginal stripe; anal fin transparent; caudal fin dusky-pink, caudal filament yellow; pelvic fins transparent; pectoral fins pink, with dusky base.

Geographical Distribution: Fiji and Vanuatu (Fig. 101).

Fig. 101

Habitat and Biology: A benthic species, occurs on sand or mud bottoms close to reefs in depths of 27 to 273 m.

Size: Maximum size is 22 cm SL, commonly 17 cm SL.

Interest to Fisheries: Taken by handline. Appears in local fish markets. No major fishery exists.

Remarks: This species appears most closely related to ***N. aurifilum*** and ***N. bathybius***, but differs principally in coloration.

Nemipterus zysron **(Bleeker, 1856-57)** Fig. 102, Plate IV, a **NEMIP Nem 7**

Dentex zysron Bleeker, 1856-57, Nat. Tijdschr. Ned.-Indië, 12: 219 (Nias).

Synonyms: ***Dentex metopias*** Bleeker (1857); ***Heterognathodon petersii*** Steindachner (1864).

FAO Names: **En** - Slender threadfin bream. **Fr** - Cohana élégante. **Sp** - Baga elegante.

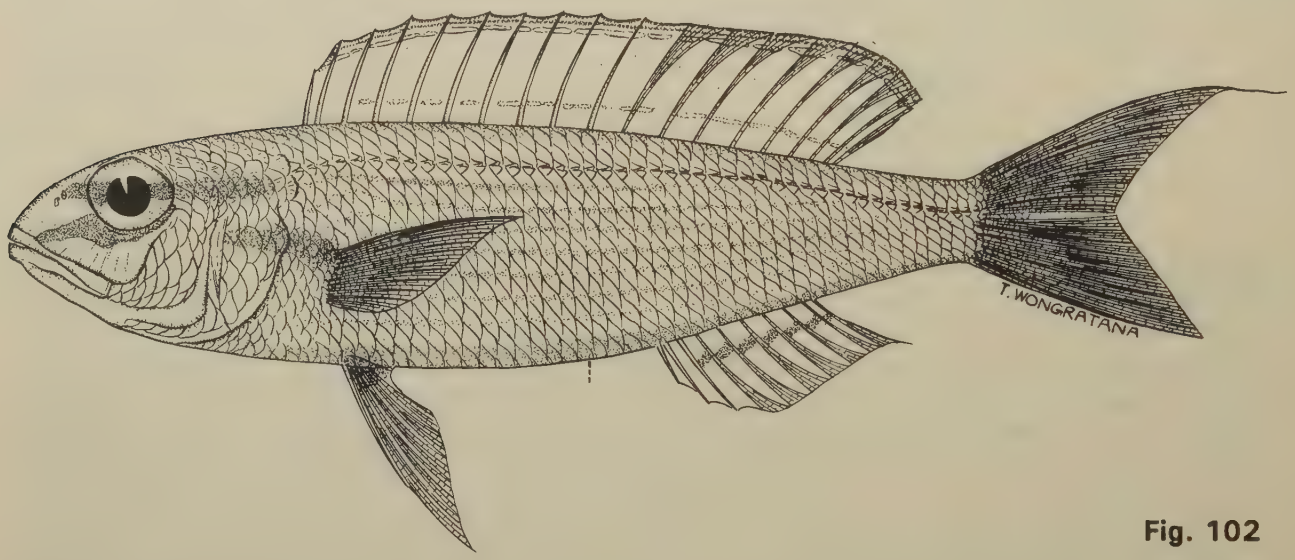


Fig. 102

Diagnostic Features: Body depth 3.8 to 4.6 in SL; snout length about equal to or less than diameter of eye; diameter of eye 2.6 to 3.5 in head length; lower margin of eye tangent to or just above a line from tip of snout to upper base of pectoral fin; interorbital width 1.5 to 2.3 in eye; suborbital depth 1.6 to 3.3 in eye diameter; a line drawn up from the posterior edge of suborbital reaching the dorsal profile about 2 to 6 scale rows before origin of dorsal fin; preopercle naked width 1.5 to 2.4 in scaly width; pectoral and pelvic fins short, reaching to just short of level of anus; pectoral fins 1.1 to 1.4 in head length, pelvic fins 1.2 to 1.7 in head length; caudal fin forked, upper lobe produced into a short filament; 3 or 4 pair of small recurved canines anteriorly in upper jaw; gill rakers 10 to 15. **Colour**: upper part of body reddish, silvery below; sides below lateral line with indistinct yellow stripes along the middle of each scale row; head pinkish, suffused with mauve on the snout; yellow stripes in front of eye through nostrils, and from upper lip to beneath eye; less distinct golden stripe from behind eye to origin of lateral line, and across upper part of opercle to upper base of pectoral fin; dorsal fin pale yellow with a bright yellow margin; a pale mauve submarginal stripe and pale mauve stripe near base of dorsal fin; anal fin pale lilac with a series of elongate yellow spots or yellow stripe submedially; caudal fin pinkish, upper and lower lobes pale yellowish, filament yellow; pectoral fins pale yellow; pelvic fin translucent whitish, base of fin and axillary scale pale yellow.

Geographical Distribution: Widespread in the Indo-West Pacific from northwestern Australia, the Indo-Malay archipelago, Andaman Sea, Red Sea, Seychelles and Zanzibar (Fig. 103).

Fig. 103

Habitat and Biology: A benthic species, found on sand bottoms near rocks in depths between 10 and 125 m. It swims in groups and feeds on bottom organisms.

Size: Maximum size is 18.5 cm SL, commonly 16 cm SL.

Interest to Fisheries: Taken by handline and bottom trawl along with other species of ***Nemipterus***. Appears in small numbers in local markets. No major fishery exists.

Local Names: AUSTRALIA: Yellow-cheeked threadfin bream. PHILIPPINES: Bisugo (Tagalog), Lagao (Visayan). THAILAND: Pla Sai Dang. PAKISTAN: Katti (Sindhi), Konto (Baluchi). TANZANIA: Koana. MADAGASCAR: Koana.

Literature: The following have all reported this species as ***N. metopias***: Fischer & Whitehead (1974); Schroeder (1980); Fischer & Bianchi (1984); Bauchot & Bianchi (1984); Gloerfelt-Tarp & Kailola (1984, but figured as ***N. mesoprion***); Sainsbury et al. (1984); Shen (1984); Bianchi (1985a, 1985b). Kuronuma & Abe (1986) report it as ***N. nemurus***. Allen & Swainston (1988) correctly use the name ***N. zysron***.

Remarks: This species has generally been treated under the name ***N. metopias*** by most previous authors, but the name ***N. zysron*** has priority.

Parascolopsis Boulenger, 1901

NEMIP Para

Genus: ***Parascolopsis*** Boulenger, 1901, Ann. Mag. nat. Hist., (7)7: 262. Type species ***Parascolopsis townsendi*** Boulenger, 1901, by monotypy.

Synonyms: None.

Diagnostic Features: Small fish with a moderately deep, laterally compressed body. Teeth villiform, in tapering bands in both jaws; anterior teeth small, conical in some species; canine teeth absent. Gill rakers short and stubby, 8 to 19 on first arch. Second anal spine usually longer and more robust than first or third; pectoral fins long, with 2 unbranched and 12 to 15 branched rays; pelvic fins long or moderately long, with 1 spine and 5 soft rays; anal fin with 3 spines and 7 soft rays (last ray branched at base); second anal spine usually more robust than first or third; caudal fin emarginate. Scales on top of head reaching forward to level of middle of eyes, or to level of posterior nostrils; suborbital scaly or naked; posterior margin of suborbital smooth, denticulate or finely serrate; upper corner of suborbital with a small spine, or spine absent; preopercle scaly, with 4 or 5 transverse scale rows; lower limb of preopercle naked or scaly; posterior margin of preopercle serrate; opercle scaly; upper margin of opercle with a small, flat embedded spine. Lateral-line scales 34 to 40 (usually 35 to 38); 2½ to 5 transverse scale rows above lateral line, 11 to 15 rows below. **Colour**: variable, but usually reddish, with yellow or silver markings.

Biology, Habitat and Distribution: Benthic, usually occurring in offshore shelf waters in depths between 20 and 410 m. Food consists mainly of small benthic invertebrates.

Geographical Distribution: Tropical Indian Ocean to western Pacific Ocean.

Interest to Fisheries: No major fishery exists for species of ***Parascolopsis***. Small numbers have been taken mainly by exploratory fishing vessels using bottom trawl, deep sea shrimp trap, and vertical long line. Rarely marketed.

Remarks: Species of ***Parascolopsis*** have been previously assigned to the genus ***Scolopis*** by some authors.

Key to the Species of *Parascolopsis*

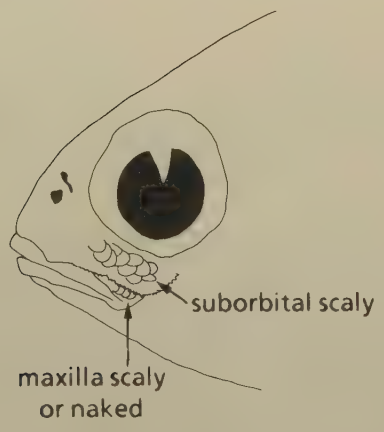
1a. Gill rakers on first arch 17 to 19 (Indo-W. Pacific) . . . . ***P. eriomma*** (Fig. 104, Plate IV, c)

1b. Gill rakers on first arch 8 to 14

2a. Suborbital scaly; maxilla scaly or naked (Fig. 105) (W. Indian Ocean) . . . . . ***P. townsendi*** (Fig. 106)

2b. Suborbital and maxilla naked

P. eriomma **Fig. 104**



P. townsendi **Fig. 105**

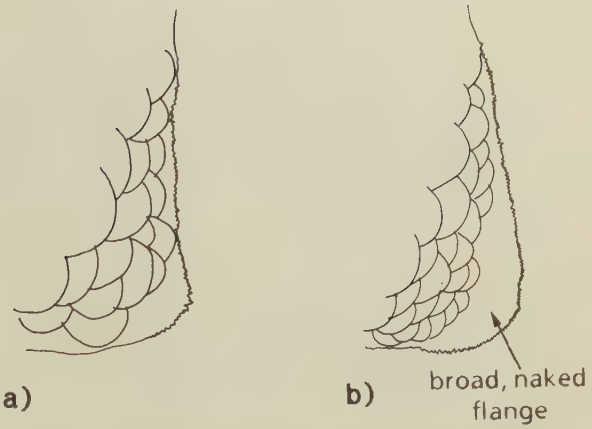
P. townsendi **Fig. 106**

3a. Preopercle more or less entirely scaled or with an incomplete naked flange posteriorly on its free margin (Fig. 107a) (S. Japan, Philippines, Indonesia) . . . . . ***P. tosensis*** (Fig. 108, Plate IV, h)

3b. Preopercle with a distinct broad naked flange bordering its free margin (Fig. 107b)

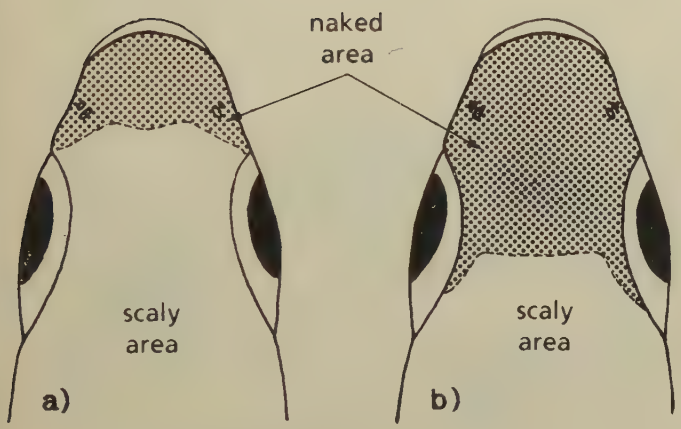
4a. Head scales reaching forward to or in front of anterior margin of eyes (Fig. 109a)

5a. Posterior margin of suborbital smooth or with just a few tiny spines (Fig. 110a); black blotch at base of middle of dorsal fin (colour retained in preserved specimens) (N.W. Indian Ocean) . . . . . ***P. aspinosa*** (Fig. 111, Plate IV, b)

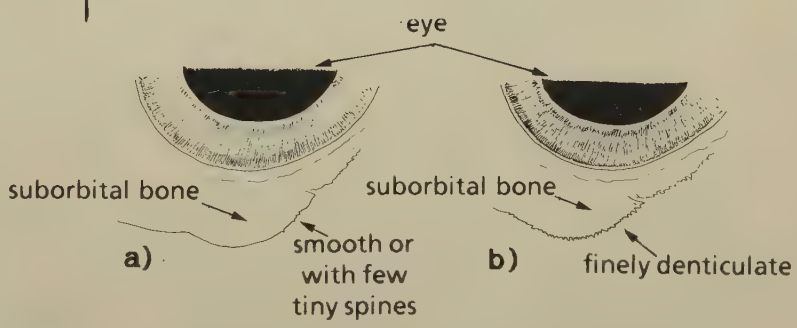


squamation on preopercle **Fig. 107**

P. tosensis **Fig. 108**



top of head showing forward extent of scales **Fig. 109**



posterior margin of suborbital bone **Fig. 110**

P. aspinosa **Fig. 111**

5b. Posterior and anterior margin of suborbital finely denticulate (Fig. 110b); red spot between seventh and tenth dorsal spines (colour not retained in preserved specimens) (E. coast of India) . . . . ***P. boesemani*** (Fig. 112)

P. boesemani **Fig. 112**

4b. Head scales reaching forward to about middle of eyes, or between middle and anterior margin of eyes (Fig. 109b)

6a. Gill rakers on first arch 8 to 10

6b. Gill rakers on first arch 11 to 14 (W. Sumatra) . ***P. qantasi*** (Fig. 113, Plate IV, e)

P. qantasi **Fig. 113**

7a. Interorbital width 3.2 to 3.7 in head; pelvic fins not reaching to level of anus, length of pelvics 1.6 to 1.9 in head; 4 or 5 transverse scale rows above lateral line (N.W. Australia) . . . . . ***P. rufomaculatus*** (Fig. 114, Plate IV, f)

7b. Interorbital width 4.3 to 5.4 in head; pelvic fins reaching to or beyond level of anus, length of pelvics 1.2 to 1.5 in head; 2½ or 3 transverse scale rows above lateral line

P. rufomaculatus **Fig. 114**

8a. Dusky band joining nostrils across snout; fourth or fifth dorsal ray elongate in larger specimens (Philippines, Indonesia, N.W. Australia) . . . . ***P. tanyactis*** (Fig. 115, Plate IV, g)

P. tanyactis **Fig. 115**

8b. Dusky band across snout absent; fourth or fifth dorsal ray not notably elongate (W. Pacific to E. Indian Ocean) . . . . . ***P. inermis***
(Fig. 116, Plate IV, d)

P. inermis **Fig. 116**

Parascolopsis aspinosa (Rao & Rao, 1981) | Fig. 117, Plate IV, b | **NEMIP Para 1**

Scolopsis aspinosa Rao & Rao, 1981, Proc. Kon. Ned. Akad. Wetensch., Ser. C, 84: 134, fig. 1, 3 (Waltair, India).

Synonyms: ***Parascolopsis jonesi*** Talwar (1986).

FAO Names: En - Smooth dwarf monocle bream. **Fr** - Mamila lisse. **Sp** - Besugato liso.

Fig. 117

Diagnostic Features: Body depth 2.5 to 3.0 in SL; snout length less than diameter of eye; gill rakers 10 or 11; head scales reaching forward to between level of anterior margin of eyes and posterior nostrils; posterior margin of preopercle more or less vertical; lower limb of preopercle naked; posterior margin of suborbital smooth or with just a few tiny spines; suborbital depth 2.6 to 4.6 in eye diameter; lateral-line scales 35 or 36; pectoral-fin rays ii, 14 or 15 (usually ii, 15); pectoral and pelvic fins long, reaching to or beyond level of anus. **Colour**: body rosy-orange; 4 pale reddish saddles on back and 2 on caudal peduncle; suborbital and edge of preopercle silvery-yellow; a black blotch at base of dorsal fin between eighth spine and first ray; dorsal fin with orange edge; anal fin pale rosy; pectoral fin yellowish.

Geographical Distribution: Indian Ocean, including the Persian Gulf; Gulf of Oman, Gulf of Aden, Arabian Sea, Bay of Bengal and the Andaman Sea (Fig. 118).

Fig. 118

Habitat and Biology: A benthic species, found on sand or mud bottoms in offshore waters, in depths of 20 to 225 m. Feeds mainly on benthic invertebrates.

Size: Maximum size is 17 cm SL, commonly 10 cm SL.

Interest to Fisheries: Taken in small numbers by bottom trawling. No major fishery exists.

Local Names: PAKISTAN: Katti (Sindhi), Kolonto (Baluchi).

Literature: Randall et al. (1978, p 211. pl. 43, as ***Parascolopsis* sp.**); Fischer & Bianchi (1984); Bianchi (1985b).

Parascolopsis boesemani (Rao & Rao, 1981) Fig. 119 **NEMIP Para 2**

Scolopsis boesemani Rao & Rao, 1981, Proc. Kon. Ned. Akad. Wetensch., Ser. C, 84: 139, fig. 2, 4 (Waltair, India).

Synonyms: None.

FAO Names: **En** - Redfin dwarf monocle bream. **Fr** - Mamila aurore. **Sp** - Besugato aurora.

Fig. 119

Diagnostic Features: Body depth 2.8 in SL; snout length less than diameter of eye; gill rakers 9; head scales reaching forward to level of posterior nostrils; posterior margin of preopercle more or less vertical; lower limb of preopercle naked; posterior margin of suborbital finely denticulate; suborbital depth 3.8 in eye diameter; lateral-line scales 36 or 37; pectoral-fin rays ii, 14; pectoral and pelvic fins long, reaching to beyond level of anus. **Colour**: body rosy-yellow; 3 pale rosy saddles on body and 1 on caudal peduncle; two light green stripes with a slight orange tinge, below lateral line; dorsal fin silvery yellow, a blood-red blotch between seventh and tenth spines; caudal fin silvery-yellow, fork margin rosy.

Geographical Distribution: So far known only from a single specimen collected off Waltair, India (Fig. 120).

Habitat and Biology: A benthic species, found on sand or mud bottoms in offshore waters in depths of 20 to 25 m. Feeds mainly on benthic invertebrates.

Size: Standard length of the only known specimen is 9.1 cm.

Interest to Fisheries: Taken by bottom trawling. No major fishery exists.

Literature: Fischer & Bianchi (1984); Bianchi (1985b).

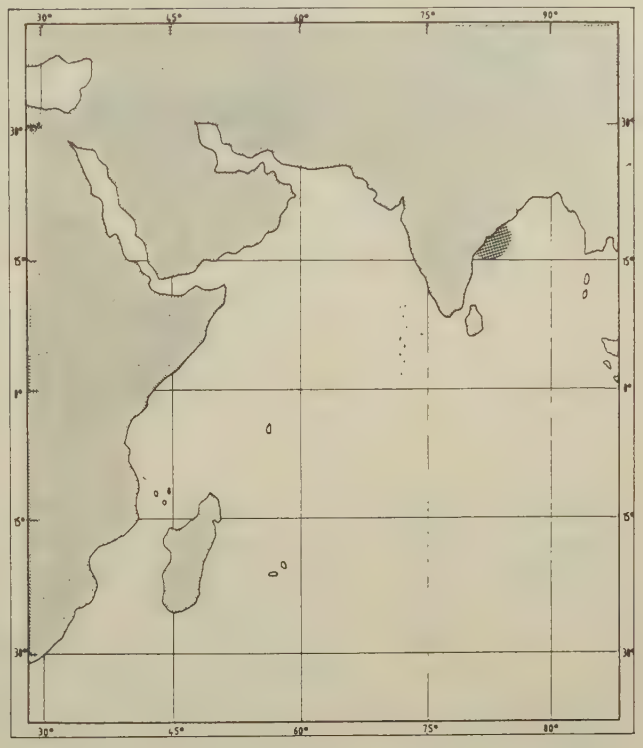


Fig. 120

Parascolopsis eriomma (Jordan & Richardson, 1909)

NEMIP Para 3

Fig. 121, Plate IV, c

Scolopsis eriomma Jordan & Richardson, 1909, Mem. Carnegie Mus., 4: 188, pl. 70 (Formosa; Ceylon).

Synonyms: None.

FAO Names: En - Rosy dwarf monocle bream. **Fr** - Mamila rosée. **Sp** - Besugato rosado.

Fig. 121

Diagnostic Features: Body depth 2.7 to 3.0 in SL; snout length less than diameter of eye; gill rakers 17 to 19; head scales reaching forward to between middle of eyes; posterior margin of preopercle more or less vertical, or sloping forward slightly; lower limb of preopercle naked; posterior margin of suborbital serrate, a small spine at upper corner; suborbital depth 2.6 to 4.8 in eye diameter; lateral-line scales 34 to 36; pectoral-fin rays ii, 14 or 15; pectoral fins long, reaching to or almost to level of anus; pelvic fins long, reaching to level of anus. **Colour**: pinkish with a broad longitudinal yellow stripe along middle of body, from above pectoral fin to base of caudal fin; a dusky, elongate blotch at origin of lateral line; upper axis of pectoral fin black; dorsal fin pink, spinous margin reddish; pectoral and caudal fin yellowish.

Geographical Distribution: Indian Ocean, including the Gulf of Oman, Red Sea, east Africa (south to Delagoa Bay), Sri Lanka, Andaman Sea; and West Pacific, including southern Japan, Taiwan, South China Sea, Philippines, Indonesia (Fig. 122).

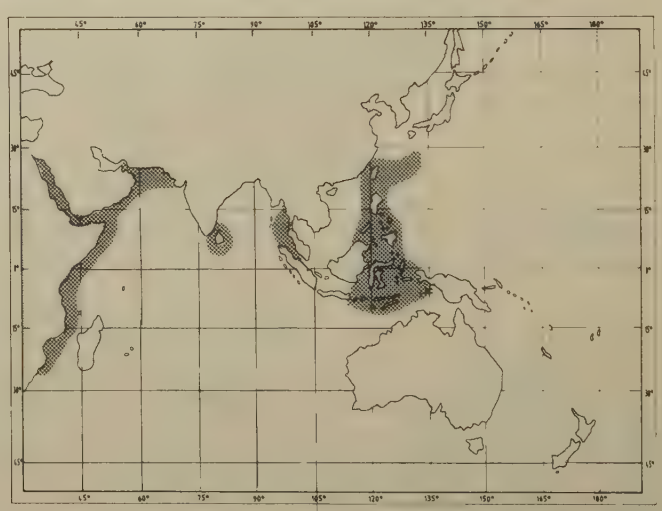


Fig. 122

Habitat and Biology: A benthic species, found on sand or mud bottoms in offshore waters in depths of 25 to 175 m. Feeds mainly on benthic invertebrates.

Size: Maximum size is 25.5 cm SL, commonly 20 cm SL.

Interest to Fisheries: Taken by vertical long line and by bottom trawl. No major fishery exists.

Local Names: TAIWAN: Dai hii, Hai tai. JAPAN: Aka-tamagashira, Shikoku-tamagashira. PHILIPPINES: Silay, Buruba, Tagisang lawin. SOUTH AFRICA: Glans-stekelwang, shimmering spinecheek.

Literature: Masuda et al. (1975, 1984); Kyushin et al. (1977); Smith (1977); Randall et al. (1978, as ***P. townsendi***); Rau & Rau (1980); Kyushin et al. (1982); Fischer & Bianchi (1984); Gloerfelt-Tarp & Kailola (1984); Bianchi (1985a, 1985b); Smith & Heemstra (1986).

Remarks: Allen & Swainston (1988) have erroneously recorded this species from northwestern Australia.

Parascolopsis inermis (Schlegel, 1843) | Fig. 123, Plate IV, d | **NEMIP Para 5**

Scolopsides inermis Schlegel in Temminck & Schlegel, 1843, Fauna Japonica: 63, pl. 28, fig. 1 (Japan).

Synonyms: ***Heterognathodon doederleini*** Ishikawa (1904).

FAO Names: En - Unarmed dwarf monocle bream.

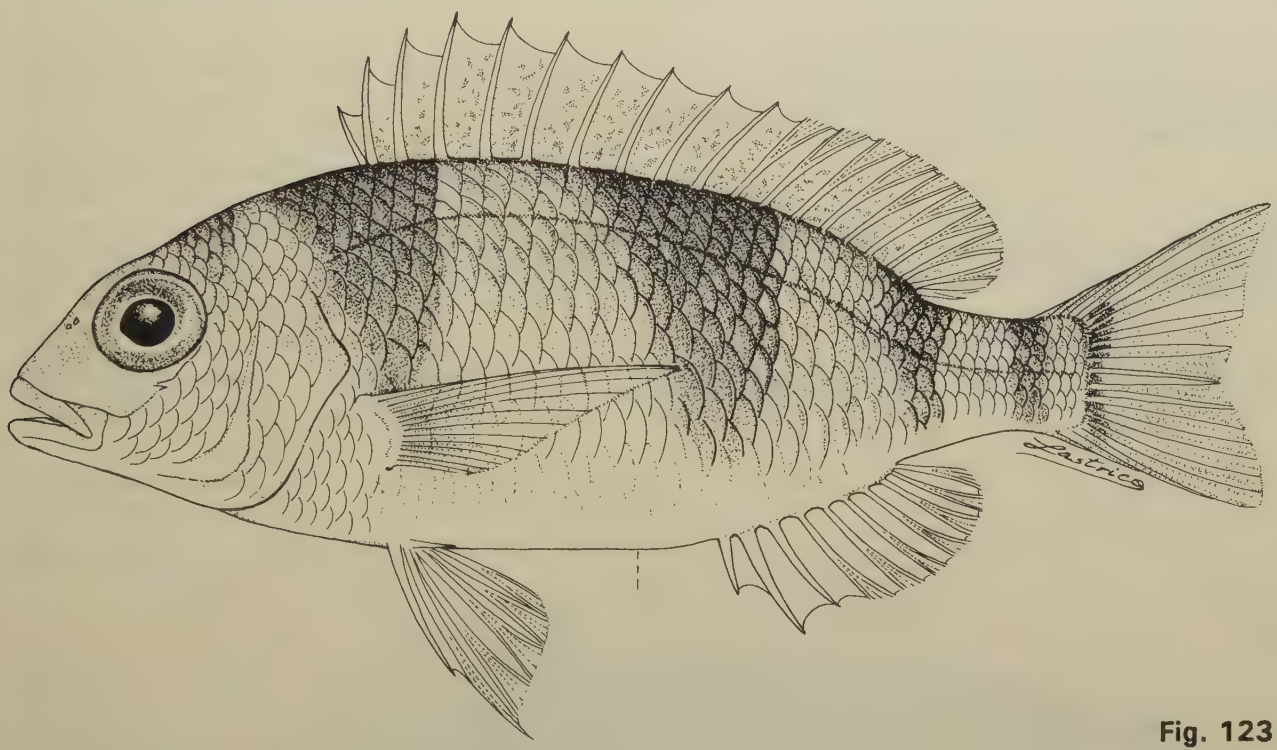


Fig. 123

Diagnostic Features: Body depth 2.6 to 2.9 in SL; snout length equal to or less than diameter of eye; gill rakers 9 or 10; head scales reaching forward to between middle of eyes; posterior margin of preopercle sloping forward slightly; lower limb of preopercle naked; posterior margin of suborbital finely serrate (sometimes smooth), a very small spine at upper corner; suborbital depth 2.5 to 3.5 in eye diameter; lateral-line scales 35; pectoral-fin rays ii, 14; pectoral fins long, reaching to or beyond level of anus; pelvic fins long, reaching to or almost to level of anus. **Colour:** body pale yellowish, silvery below; 4 broad, dark reddish bars on back; the first just in front of dorsal fin and extending down to base of pectoral fin; the second below middle of dorsal fin and extending down to midlateral part of body; the third just behind dorsal fin and extending almost to ventral surface of caudal peduncle; the fourth extending down base of caudal fin; paler, indistinct reddish bars in interspaces between darker bars; dorsal fin yellowish, with numerous red spots.

Geographical Distribution: Eastern Indian Ocean, including the Laccadive Islands, Sri Lanka, Andaman Sea; and western Pacific, including southern Japan and the South China Sea (Fig. 124).

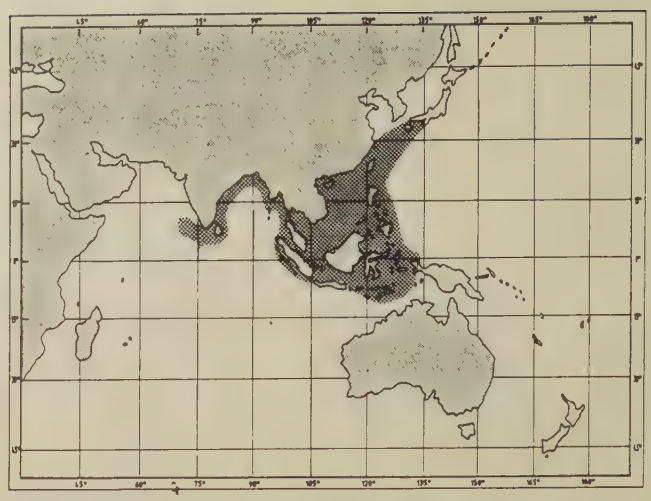


Fig. 124

Habitat and Biology: A benthic species, found on sand or mud bottoms in offshore waters in depths of 60 to 131 m. Feeds mainly on benthic invertebrates.

Size: Maximum size is 18 cm SL, commonly 12 cm SL.

Interest to Fisheries: Taken by bottom trawl, deep-sea shrimp trap and vertical long line. No major fishery exists.

Local Names: JAPAN: Tamagashira.

Literature: Masuda et al. (1975, 1984); Kyushin et al. (1977); Gloerfelt-Tarp & Kailola (1984).

Parascolopsis qantasi Russell & Gloerfelt-Tarp, 1984	NEMIP Para 6

Fig. 125, Plate IV, e

Parascolopsis qantasi Russell & Gloerfelt-Tarp, 1984, Beagle, Occ. pap. Nor. Terr. Mus. Arts Sci., 1: 112, fig. 1 (Sumatra).

Synonyms: None.

FAO Names: En - Slender dwarf monocle bream.

Fig. 125

Diagnostic Features: Body depth 3.2 to 3.3 in SL; snout length less than diameter of eye; anterior 3 or 4 pairs of teeth in upper jaw slightly enlarged; gill rakers 12 to 14; head scales reaching forward in V-shaped patch to between middle of eyes; posterior margin of preopercle more or less vertical; lower limb of preopercle naked; posterior margin of suborbital with 2 or 3 tiny spines, a small spine at upper corner; suborbital depth 4.7 to 6.2 in eye diameter; lateral-line scales 34 or 35; pectoral-fin rays ii, 14 or 15; pectoral fins moderately long, reaching to or just short of anus; pelvic fins long, reaching to beyond anus. **Colour**: dark brownish on back, paling to whitish below; dorsal fin faintly pink-suffused, with brownish diagonal lines or rows of spots; anal fin transparent; caudal fin yellowish-pink with brownish narrow wavy stripes; pectoral fins yellowish-pink, a prominent black spot at base of fin; pelvic fins transparent.

Geographical Distribution: Known only from two specimens trawled in Mentawi Strait, off western Sumatra, Indonesia (Fig. 126).

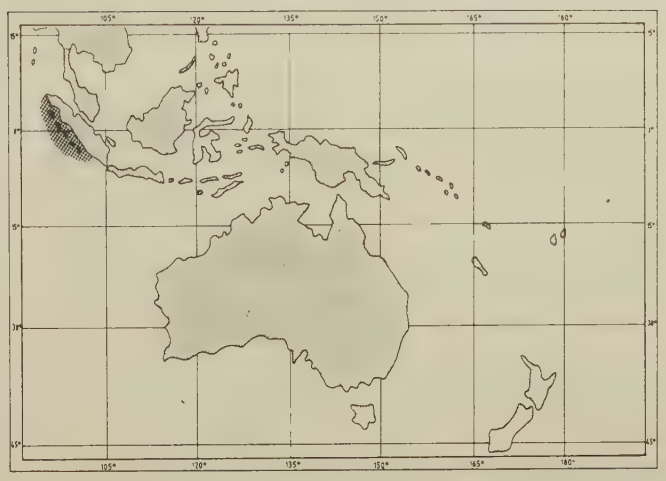


Fig. 126

Habitat and Biology: A benthic species inhabiting mud bottoms in depths of 65 to 70 m.

Size: Maximum size is 10.3 cm.

Interest to Fisheries: Taken by bottom trawl. No major fishery exists.

Literature: Gloerfelt-Tarp & Kailola (1984).

Parascolopsis rufomaculatus Russell, 1986b | Fig. 127, Plate IV, f | **NEMIP Para 7**

Parascolopsis rufomaculatus Russell, 1986, Beagle, Occ. pap. Nor. Terr. Mus. Arts Sci., 3: 137, fig. 2 (northwestern Australia).

Synonyms: None.

FAO Names: En - Red-spot dwarf monocle bream.

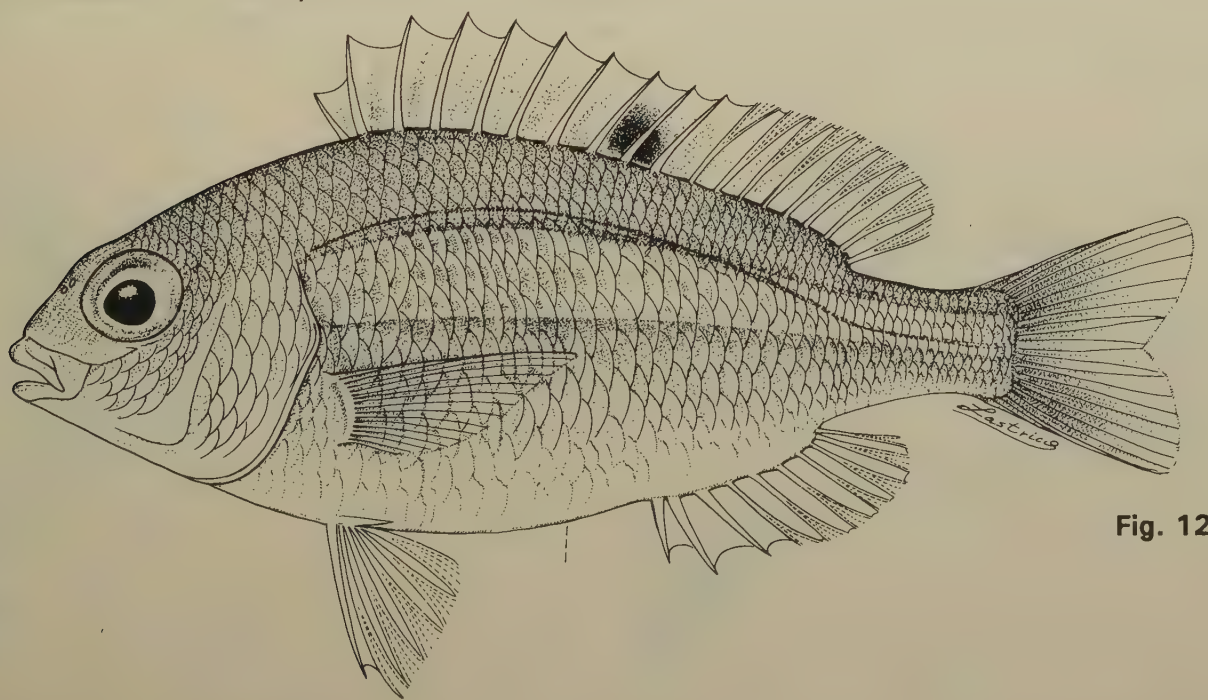


Fig. 127

Diagnostic Features: Body depth 2.4 to 2.7 in SL; snout length equal to or less than diameter of eye; gill rakers 9 to 12; head scales reaching forward to between middle of eyes; posterior margin of preopercle sloping forward slightly; lower limb of preopercle naked; posterior margin of suborbital finely denticulate; suborbital depth 3.0 to 5.1 in eye diameter; lateral-line scales 35 to 37; pectoral-fin rays ii, 13 to 15; pectoral fins moderately long, reaching to or just short of level of anus; pelvic fins short, not reaching to level of anus. **Colour:** body pinkish, pearly-white below; broad pale golden stripe below lateral line, from upper margin of opercle to caudal peduncle; dorsal fin yellowish, a bright red spot between eighth and tenth spines.

Geographical Distribution: Known so far only from northwestern Australia (Fig. 128).

Fig. 128

Habitat and Biology: A benthic species, occurring in offshore waters in depths of 200 to 350 m. Feeds mainly on benthic invertebrates.

Size: Maximum size is 15.5 cm SL, commonly 10 cm SL.

Interest to Fisheries: Taken by bottom trawl (scampi net). No fishery exists.

Local Names: AUSTRALIA: Yellow-banded dwarf monocle bream.

Literature: Sainsbury et al. (1984, as ***Parascolopsis*** sp. 1).

Parascolopsis tanyactis Russell, 1986b	Fig 129, Plate IV, g	**NEMIP Para 8**

Parascolopsis tanyactis Russell, 1986, Beagle, Occ. pap. Nor. Terr. Mus. Arts Sci., 3: 140, fig. 3 (northwestern Australia, Indonesia, Philippines).

Synonyms: None.

FAO Names: En - Long-rayed dwarf monocle bream.

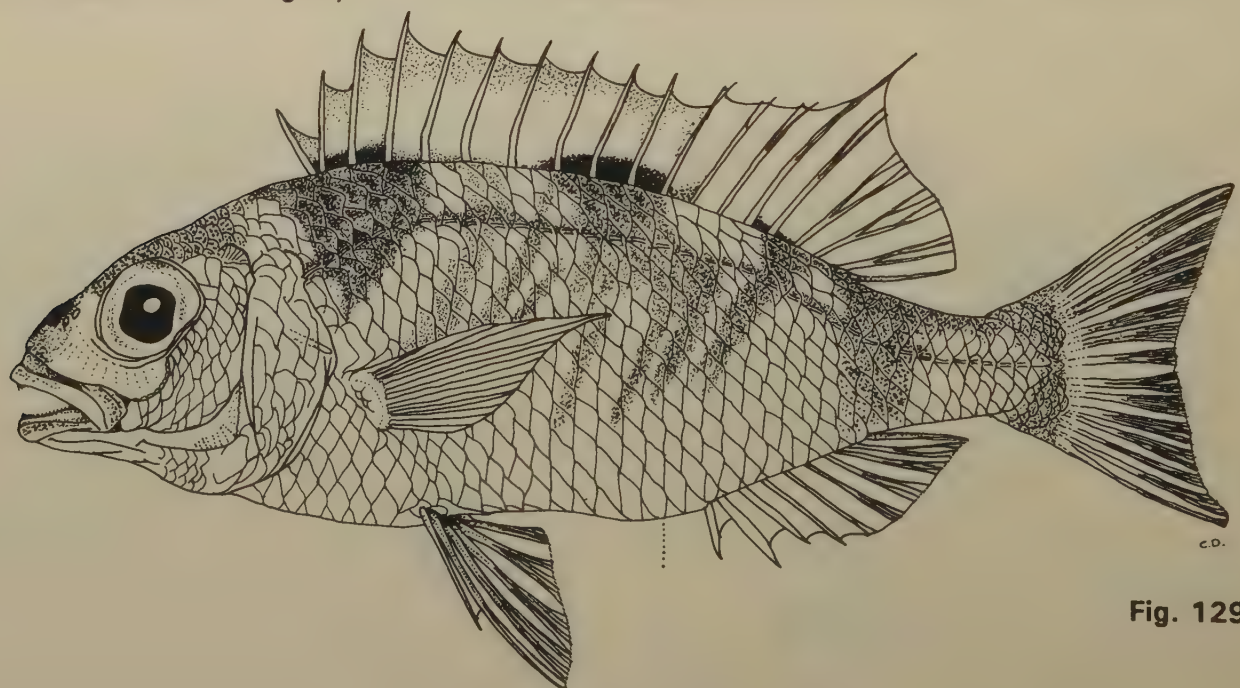


Fig. 129

Diagnostic Features: Body depth 2.6 to 3.0 in SL; snout length about equal to or less than diameter of eye; gill rakers 8 to 10; head scales reaching forward to or almost to anterior margin of eye; posterior margin of preopercle sloping backward slightly; lower limb of preopercle naked; suborbital naked; posterior margin of suborbital smooth or with a few tiny spines, 1 or 2 tiny spines at upper corner; suborbital depth 1.7 to 5.0 in eye diameter; lateral-line scales 35 to 38; pectoral-fin rays ii, 14 or 15; pectoral fins moderately long, reaching to or just short of level of anus; pelvic fins moderately long, reaching to about level of anus; fourth or fifth dorsal rays elongate, at least in larger specimens. **Colour**: pinkish, darker on back and becoming silvery on ventral surface; four dark brownish-pink saddles or bars on back; pale lemon-yellow stripe on either side of ventral midline from base of pelvic fins to base of caudal fin; area between eyes greenish yellow, a pale mauve stripe joining eyes through nostrils; dorsal fin pink with dusky reticulated markings, anteriormost three saddles on back extending onto basal part of fin.

Geographical Distribution: Western Pacific, including the Philippines, eastern Indonesia and northwestern Australia (Fig. 130).

Fig. 130

Habitat and Biology: A benthic species, occurring in offshore waters in depths of 40 to 200 m. Feeds mainly on benthic invertebrates.

Size: Maximum size is 20.5 cm SL, commonly 15 cm SL.

Interest to Fisheries: Taken by bottom trawl. No fishery exists.

Local Names: AUSTRALIA: Yellow-bellied dwarf monocle bream.

Literature: Gloerfelt-Tarp & Kailola (1984, as ***Parascolopsis*** sp. 1); Sainsbury et al. (1984, as ***Parascolopsis*** sp. 2); Allen & Swainston (1988).

Parascolopsis tosensis (Kamohara, 1938) | Fig. 131, Plate IV, h | **NEMIP Para 9**

Scolopsis tosensis Kamohara, 1938, Offshore bottom-fishes Prov. Tosa, Japan: 32, fig. 14 (Province Tosa, Shikoku, Japan).

Synonyms: None.

FAO Names: En - Tosa dwarf monocle bream.

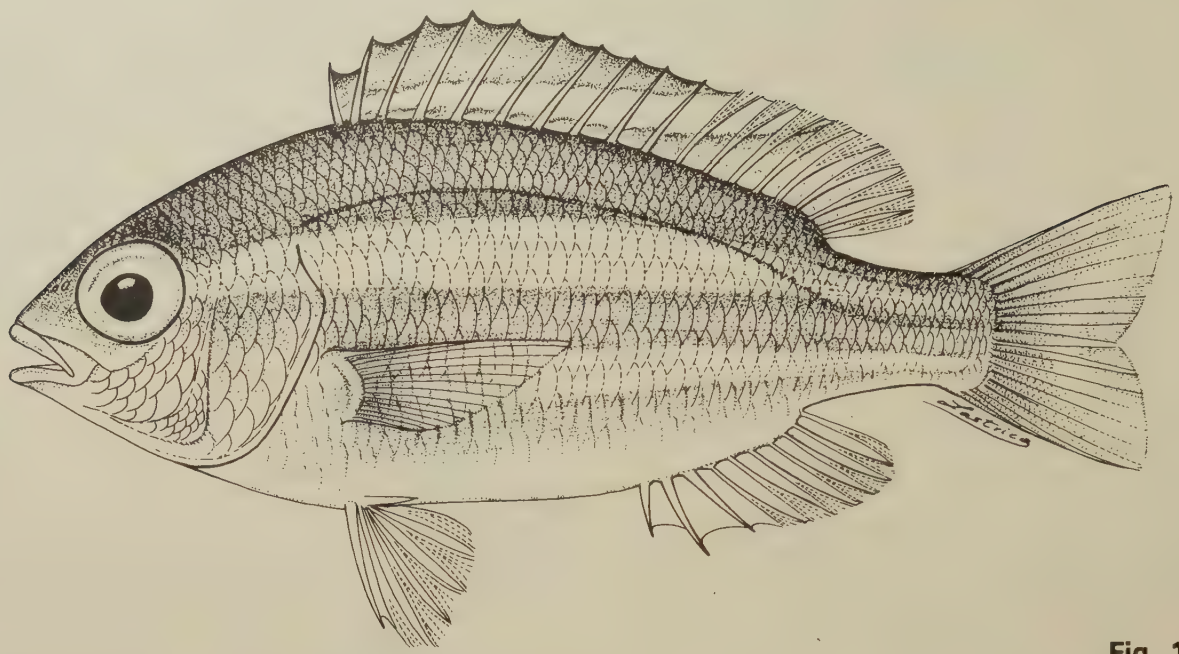


Fig. 131

Diagnostic Features: Body depth 2.4 to 2.8 in SL; snout length less than diameter of eye; anterior teeth in upper jaw slightly enlarged; gill rakers 8 to 10; head scales reaching forward almost to level of anterior margin of eyes; posterior margin of preopercle sloping forward slightly; lower limb of preopercle scaly; posterior margin of preopercle denticulate, a very small spine at upper corner; suborbital depth 4.0 to 8.8 in eye diameter; lateral-line scales 35 to 38; pectoral-fin rays ii, 12 to 14; pectoral fins short, not reaching to level of anus; pelvic fins short, not reaching near level of anus. **Colour**: light reddish, paler below; 2 broad longitudinal yellow stripes; the upper from behind eye to middle of caudal base; the lower from above pectoral fin to lower caudal base; outer part of spinous dorsal and margin of soft dorsal reddish; a broad yellow stripe from base of spinous dorsal to outer anterior part of soft dorsal fin; caudal-fin margin reddish.

Geographical Distribution: West Pacific, including southern Japan, Taiwan, the Philippines and eastern Indonesia (Fig. 132).

Habitat and Biology: A benthic species occurring in offshore waters in depths of 150 to 300 m.

Size: Maximum size is 10 cm SL, commonly 8 cm SL.

Interest to Fisheries: Very rarely found in markets. No major fishery exists.

Local Names: JAPAN: Kisuji-tamagashira.

Literature: Gloerfelt-Tarp & Kailola (1984); Shao & Chen (1988).

Fig. 132

Parascolopsis townsendi Boulenger, 1901 | Fig. 133 | NEMIP Para 4

Parascolopsis Townsendi Boulenger, 1901, Ann. Mag. nat. Hist., (7) 7: 262, pl. 6 (Gulf of Oman).

Synonyms: None.

FAO Names: **En** - Scaly dwarf monocle bream. **Fr** - Mamila mignonne. **Sp** - Besugato menudo.

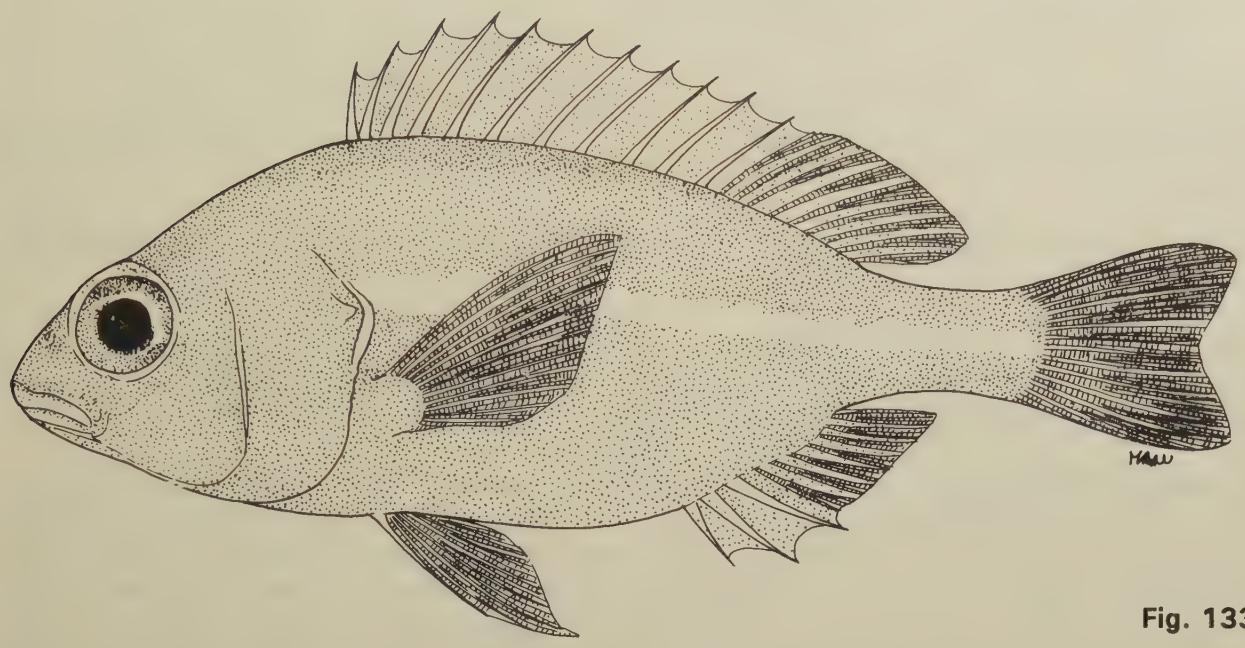


Fig. 133

Diagnostic Features: Body depth 2.4 to 2.7 in SL; snout length equal to or less than diameter of eye; gill rakers 10 to 13; head scales reaching forward to level of posterior nostrils; posterior margin of preopercle sloping backward slightly; lower limb of preopercle scaly; suborbital scaly; posterior margin of suborbital finely serrate, no spine at upper corner; suborbital depth 2.8 to 5.2 in eye diameter; lateral-line scales 37 to 40; pectoral-fin rays ii, 13 to 15; pectoral fins long, reaching to above origin of anal fin; pelvic fins long, reaching to or almost to level of anus. **Colour**: uniform reddish with a silvery lateral stripe.

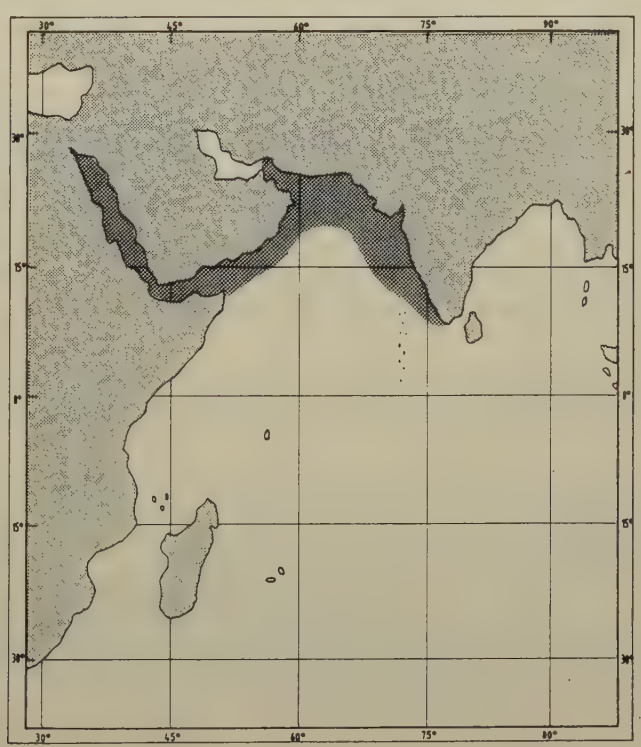


Fig. 134

Geographical Distribution: Western Indian Ocean, including the Gulf of Oman, Gulf of Aden, Red Sea and Arabian Sea (Fig. 134).

Habitat and Biology: A benthic species, found on sand or mud bottoms in offshore waters in depths of 100 to 410 m. Feeds mainly on benthic invertebrates.

Size: Maximum size is 15.5 cm SL, commonly 10 cm SL.

Interest to Fisheries: Taken by bottom trawl. No major fishery exists.

Literature: Fischer & Bianchi (1984); Bianchi (1985b).

Pentapodus Quoy & Gaimard, 1824

NEMIP Pent

Genus: ***Pentapodus*** Quoy & Gaimard, 1824, Voy. "Uranie": 294. Type species ***Pentapodus vitta*** Quoy & Gaimard, by monotypy.

Synonyms: Genus ***Pentapus*** Valenciennes in C. & V., 1830; Genus ***Maenoides*** Richardson, 1843b; Genus ***Heterodon*** Bleeker, 1845 (nomen nudum); Genus ***Heterognathodon*** Bleeker, 1848; Genus ***Leptoscolopsis*** Tanaka, 1915; Genus ***Lunicauda*** Whitley, 1947.

Diagnostic Features: Small fish with an elongate, compressed body. Teeth small and conical or villiform, in tapering bands in both jaws; 2 or 3 pair of larger, slightly recurved canines anteriorly in the upper jaw; lower jaw usually with a pair of enlarged, laterally flared canines anteriorly; lateral teeth of lower jaw moderately enlarged, conical; gill rakers short and stubby, 7 to 15 on first arch. Pectoral fins short, with 2 unbranched and 13 to 15 branched rays; pelvic fins short or moderately long; anal spines more or less equally robust; caudal fin forked; upper and/or lower lobes of caudal fin pointed, falcate or produced to form a long trailing filament. Scales on top of head reaching forward to level of anterior margin of eyes, or to in front of level of nostrils; suborbital naked or scaly; posterior edge of suborbital smooth; opercle scaly; preopercle scaly, with 4 or 5 transverse scale rows; lower limb of preopercle naked or scaly; posterior margin of preopercle smooth or finely serrate; upper margin of opercle with a small, flat, embedded spine. Lateral-line scales 42 to 56, 2½ to 6 transverse scale rows above lateral line, 11 to 20 rows below. **Colour:** extremely variable.

Biology, Habitat and Distribution: Benthic or free-swimming near the bottom; usually occurring on or close to reefs, in depths down to 100 m; either solitary or in aggregations. ***Pentapodus*** species feed primarily on small fishes, crustaceans and polychaete worms; free-swimming species feed also on larger zooplankton.

Geographical Distribution: Western Pacific, including southern Japan, Indo-Malay Archipelago, Australia, in tropical and subtropical waters.

Interest to Fisheries: No major fishery exists for species of ***Pentapodus***, although ***P. setosus*** is landed in small quantities along with other species taken by bottom trawl in the Strait of Malacca and in the South China Sea. Small numbers of other ***Pentapodus*** species are caught by local artisanal fishermen mainly by handline. They are usually marketed fresh.

Literature: Fowler (1933); Weber & de Beaufort (1936); Akazaki (1959, 1962).

Key to the Species of *Pentapodus*

1a. Caudal fin with upper rays or upper and lower rays produced into long trailing filaments

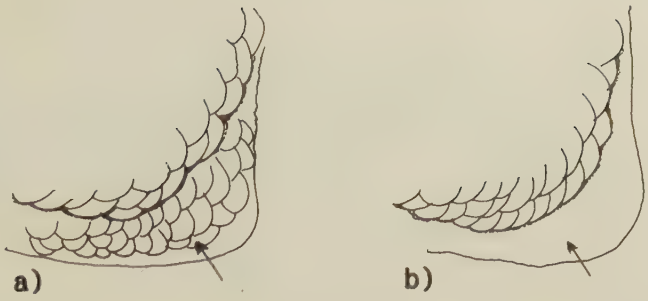
2a. Upper and lower lobes of caudal fin produced into long trailing filaments; lower limb of preopercle scaly, at least posteriorly (Fig. 135a); lateral-line scales 50 to 56 (usually 52 to 54) (Philippines, Indonesia, N.W. Australia) . . ***P. emeryii*** (Fig. 136, Plate V, c)

2b. Upper lobe of caudal fin only produced into long trailing filament; lower limb of preopercle naked (Fig. 135b); lateral-line scales 46 to 50

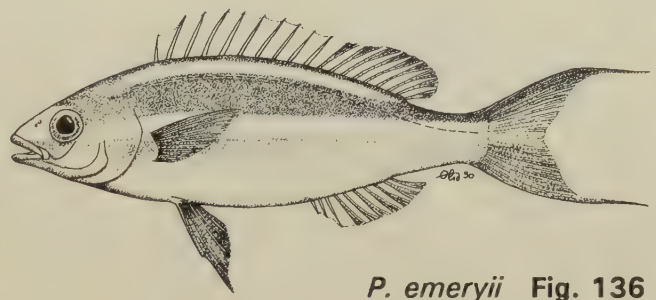
3a. Three dusky stripes (blue in life) on snout; first from eye to tip of snout, second from eye across snout in front of nostrils, third joining eyes behind nostrils (N.E. Australia, Papua New Guinea, Solomon Is) . . . . . ***P. paradiseus*** (Fig. 137, Plate V, e)

3b. Two dusky stripes (blue in life) on snout; first from eye to middle of upper lip, second from eye to tip of snout; no stripe joining eyes (Philippines, Indo-Malay Archipelago) . . . . . ***P. setosus*** (Fig. 138, Plate V, g)

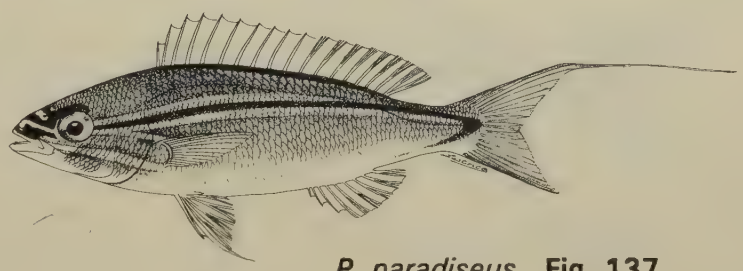
1b. Caudal fin without long filamentous extensions, lobes pointed, sharply pointed, or falcate



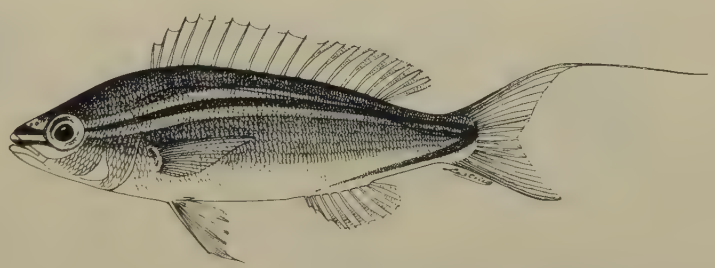
squamation on preopercle **Fig. 135**



P. emeryii **Fig. 136**



P. paradiseus **Fig. 137**



P. paradiseus **Fig. 138**

4a. Head scales reaching forward dorsally to or in front of posterior nostril

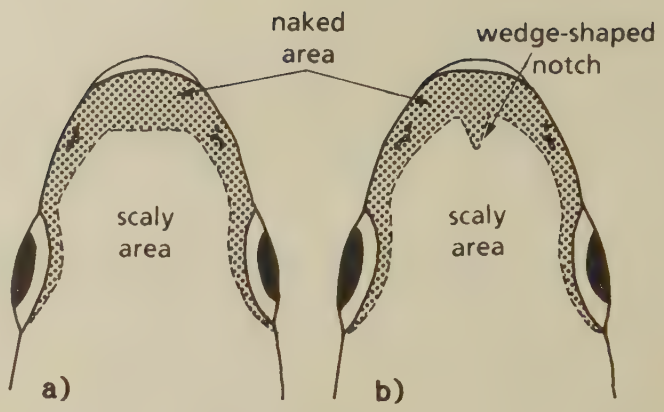
5a. Head scales reaching to between posterior and anterior nostrils; scaled area between nostrils rectilinear (Fig. 139a) (Philippines, Indo-Malay Archipelago) . . . . . ***P. bifasciatus*** (Fig. 140, Plate V, a)

5b. Head scales extending to or in front of anterior nostril; scaled area between nostrils with a naked, medial, wedge-shaped notch anteriorly (Fig. 139b)

6a. Lower limb of preopercle scaly; caudal fin forked, lobes falcate, upper lobe usually longer than lower (Philippines, Indo-Malay Archipelago) . ***P. caninus*** (Fig. 141, Plate V,b)

6b. Lower limb of preopercle naked; caudal fin forked, lobes pointed, more or less equal in length (south-western Australia) ***P. vitta*** (Fig. 142, Plate VI, b)

4b. Head scales reaching forward dorsally to anterior margin of eye or almost to posterior nostril



top of head showing forward extent of scales **Fig. 139**

P. bifasciatus **Fig. 140**

P. caninus **Fig. 141**

P. vitta **Fig. 142**

7a. Lower limb of preopercle naked

8a. Snout length greater than eye diameter; body moderately deep (depth 3.0 to 3.7 in SL); black spot on caudal peduncle (N.W. Australia) . ***P. porosus*** (Fig. 143, Plate V, f)

8b. Snout length equal to or less than eye diameter; body slender (depth 3.9 to 4.5 in SL); no spot on caudal peduncle (Japan, S. China Sea, N. Australia) . . . . . ***P. nagasakiensis*** (Fig. 144, Plate V,d)

7b. Lower limb of preopercle scaly

9a. Body pale with 3 dusky stripes (brown in life) along sides; dark bar at base of pectoral fin (Indo-Malay Archipelago, New Guinea, Solomon Is) . . . . . ***P. trivittatus*** (Fig. 145, Plate VI, a)

9b. Body colour not as above; no dark bar at base of pectoral fin (W. Pacific, from Taiwan to Samoa) . . . . . ***P.* sp.** (Fig. 146, Plate V,h)

P. porosus **Fig. 143**

P. nagasakiensis **Fig. 144**

P. trivittatus **Fig. 145**

Pentapodus sp. **Fig. 146**

Pentapodus bifasciatus (Bleeker, 1848) | Fig. 147, Plate V, a | **NEMIP Pent 1**

Heterognathodon bifasciatus Bleeker, 1848, J. Ind. Arch., 2: 636 (Sumbawa, Indonesia).

Synonyms: ***Pentapodus lineoscapularis*** Fowler, 1943.

FAO Names: En - White-shouldered whiptail.

Fig. 147

Diagnostic Features: Snout length about equal to diameter of eye; head scales reaching forward to between level of posterior and anterior nostrils; suborbital naked; lower limb of preopercle with 2 or 3 scale rows; lateral-line scales 43 to 46 (usually 44 or 45); pectoral-fin rays ii, 13 to 15 (usually ii, 14); pelvic fins moderately long, reaching to or almost to level of anus; caudal fin forked, lobes more or less equal in length. **Colour:** upper part of body brown, white on ventral surface; a narrow whitish stripe beginning above eye along base of dorsal fin; a second whitish stripe on back above lateral line from behind eye to caudal peduncle; a third, broader whitish stripe from snout, running beneath eye across preopercle and opercle, to just above pectoral-fin base, then arching gradually along body to upper part of caudal peduncle; a brownish stripe on lower part of body from beneath pectoral-fin base to end of anal fin; a distinctive pearly-white vertical bar on upper edge of opercle.

Geographical Distribution: Philippines, Indonesia, Singapore (Fig. 148).

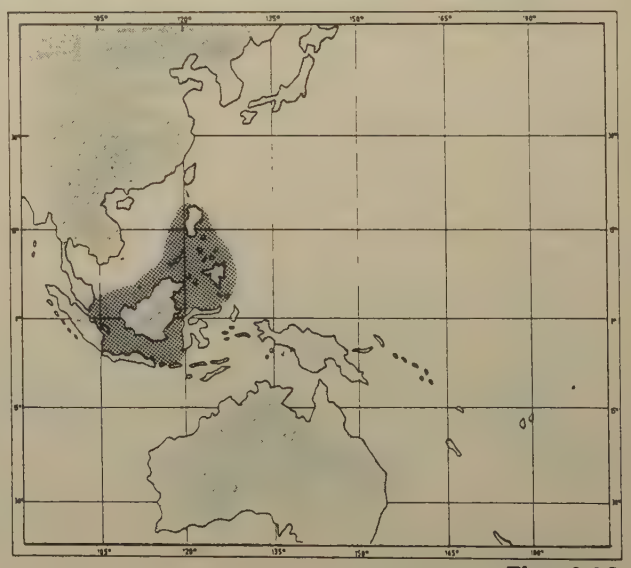


Fig. 148

Habitat and Biology: A benthic species inhabiting shallow coral reef areas. Food consists of small fishes, crustaceans (shrimps, caprellid amphipods), and polychaete worms.

Size: Maximum size is 15 cm SL, commonly 10 cm SL.

Interest to Fisheries: Appears occasionally in small numbers in local markets. No major fishery exists.

Remarks: This species has previously been confused with ***P. trivittatus***, but is easily distinguished by the head scales extending forward to the nostrils, the absence of scales on the suborbital, and presence of a white bar on the upper margin of the opercle.

Pentapodus caninus (Cuvier, 1830)	Fig. 149, Plate V, b	**NEMIP Pent 2**

Scolopsides caninus Cuvier in C. & V., 1830a, Hist. nat. poiss., 5: 354 (Doreh, New Guinea).

Synonyms: ***Heterognathodon macrurus*** Bleeker (1851a); ***Heterognathodon microdon*** Bleeker (1853b); ***Heterognathodon hellmuthii*** Bleeker (1853c); ***Pentapus formulosus*** Snyder (1913).

FAO Names: En - Small-toothed whiptail.

Fig. 149

Diagnostic Features: Snout length about equal to diameter of eye; head scales reaching forward to or just in front of level of anterior nostrils; scaled area between nostrils with a distinct naked medial wedge-shaped notch; suborbital scaly posteriorly; lower limb of preopercle with 2 or 3 scale rows; lateral-line scales 43 to 47 (usually 45 to 47); pectoral-fin rays ii, 13 to 15 (usually ii, 14); pelvic fins moderately long, reaching to or almost to level of anus; caudal fin forked, lobes strongly falcate, upper lobe slightly longer than lower. **Colour**: upper part of body pale blue, whitish on ventral surface; a narrow yellow stripe on back above lateral line from behind eye to caudal peduncle; a broader yellow midlateral stripe from behind eye to base of caudal fin; a narrow blue stripe from middle of upper lip passing beneath lower margin of eye and across preopercle and opercle; dorsal fin and caudal fin pink.

Geographical Distribution: West Pacific, including New Caledonia, Vanuatu, Solomon Islands, Papua New Guinea, Marshall Islands, Palau, southern Japan, Philippines, Indonesia (Fig. 150).

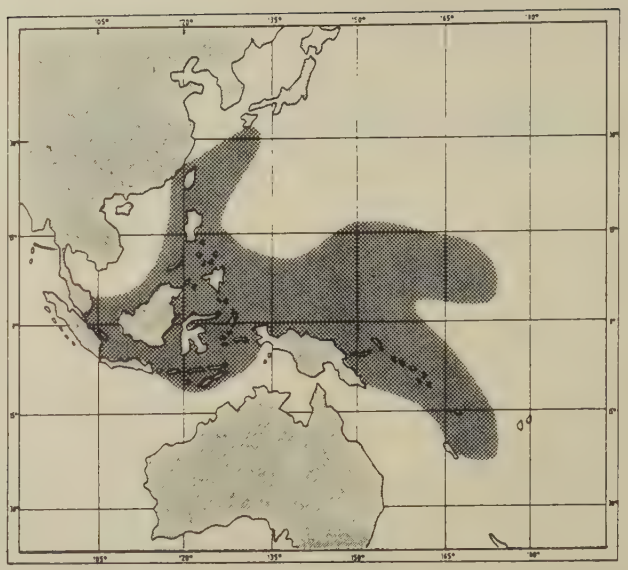


Fig. 150

Habitat and Biology: A free-swimming species which occurs solitary or in small groups. Usually found close to the bottom over coral reef areas in depths of 15 m or more. Food consists of small fishes and larger zooplankton as well as bottom-living organisms.

Size: Maximum size is 18.5 cm SL, commonly 15 cm SL.

Interest to Fisheries: Taken by handline. Appears occasionally in small numbers in local markets. No major fishery exists.

Local Names: PHILIPPINES: Bilao-bilao (Visayan); Silay, Siling (Cuyonin); Lawaian (Tagalog). INDONESIA: Gurisi, Krisi (Java). JAPAN: Kitsun-un. GUAM: Redfin mid-water bream.

Literature: The following have reported this species as ***P. macrurus***. Masuda et al. (1975, 1982); Rau and Rau (1980); Schroeder (1980); Amesbury & Myers (1982); Kyushin et al. (1982); Lee (1986); Myers (1989). Gloerfelt-Tarp & Kailola (1984) correctly use the name ***P. caninus***.

Remarks: Most authors have previously referred to this species as ***P. macrurus***, a junior synonym of ***P. caninus***, and the name ***P. caninus*** has been mistakenly applied to ***P. trivittatus***.

Pentapodus emeryii (Richardson, 1843) Fig. 151, Plate V, c **NEMIP Pent 3**

Mesoprion ? ***Emeryii*** Richardson, 1843b, Icones Piscium: 7, pl. iii, fig. 2 (Barrow Island, W. Australia).

Synonyms: ***Heterognathodon nemurus*** Bleeker (1852d).

FAO Names: En - Double whiptail.

Fig. 151

Diagnostic Features: Snout length greater than diameter of eye; head scales reaching forward to level of posterior nostrils; suborbital naked; lower limb of preopercle with 2 or 3 scale rows; lateral-line scales 51 to 55 (usually 52 to 54); pectoral-fin rays ii, 14 or 15 (usually ii, 14); pelvic fins moderately long, reaching almost to level of anus; caudal fin forked, upper and lower rays produced into very long trailing filaments. **Colour**: upper part of body blue, white on ventral surface; a narrow yellow stripe on back above lateral line, from behind eye to caudal peduncle; a broader yellow midlateral stripe from behind eye to base of caudal fin; dorsal fin yellowish; caudal fin blue with a yellow central area.

Geographical Distribution: Northwestern Australia, Indonesia, Philippines (Fig. 152).

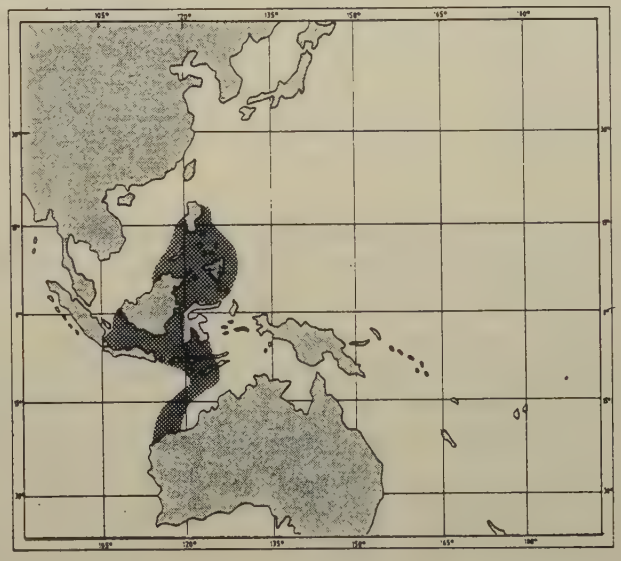


Fig. 152

Habitat and Biology: A benthic species found close to reef areas. Food consists of small fishes, crustaceans, ophiuroids and sipunculid worms.

Size: Maximum size is 24.5 cm SL, commonly 18 cm SL.

Interest to Fisheries: Appears occasionally in small numbers in local markets. No major fishery exists.

Local names: AUSTRALIA: Purple threadfin-bream. PHILIPPINES: Silay (Visayan), Bisugong maylawi (Tagalog).

Literature: Rau and Rau (1980, as ***P. nemurus***); Gloerfelt-Tarp & Kailola (1984); Allen & Swainston (1988).

Pentapodus nagasakiensis (Tanaka, 1915) Fig. 153, Plate V,d **NEMIP Pent 4**

Leptoscolopsis nagasakiensis Tanaka, 1915, Fig. Descr. Fish Japan, 19-21: 365, pl. 98, fig. 308 (coast near Nagasaki, Japan).

Synonyms: None.

FAO Names: En - Japanese whiptail.

Fig. 153

Diagnostic Features: Snout length equal to or less than diameter of eye; head scales reaching forward to between level of anterior margin of eyes and posterior nostrils; suborbital naked; lower limb of preopercle naked; lateral-line scales 44 to 47 (usually 45 or 46); pectoral-fin rays ii, 13 to 15 (usually ii, 14); pelvic fins moderately long, reaching to or almost to level of anus; caudal fin forked, lobes pointed, more or less equal in length. **Colour:** upper half of body yellowish, lower half whitish; a pearly-white midlateral stripe from snout through lower part of eye, to base of caudal fin.

Geographical Distribution: Southern Japan, South China Sea, Indonesia (Lombok), north-western Australia (Fig. 154).

Habitat and Biology: Usually inhabits deeper offshore waters, in depths of 40 to 100 m. Food consists of small crustaceans (shrimps).

Size: Maximum size is 15 cm SL, commonly 10 cm SL.

Interest to Fisheries: Rarely caught. No major fishery exists.

Local Names: AUSTRALIA: Big-eyed whiptail, Japanese butterfish. JAPAN: Ito-tamagashira.

Fig. 154

Literature: Masuda et al. (1975, 1982); Kyushin et al. (1982); Gloerfelt-Tarp & Kailola (1984); Sainsbury et al. (1984); Allen & Swainston (1988).

Pentapodus paradiseus (Günther, 1859) | Fig. 155, Plate V, e | **NEMIP Pent 5**

Pentapus paradiseus Günther, 1859, Cat. Fishes, 1: 383 (Polynesia; Sumatra).

Synonyms: ***Labrus*****?** ***iris*** Richardson (1843a) (homonym of ***Pentapus iris*** Valenciennes in C. & V., 1830b); ***Dentex filifer*** Castelnau (1875).

FAO Names: En - Paradise whiptail.

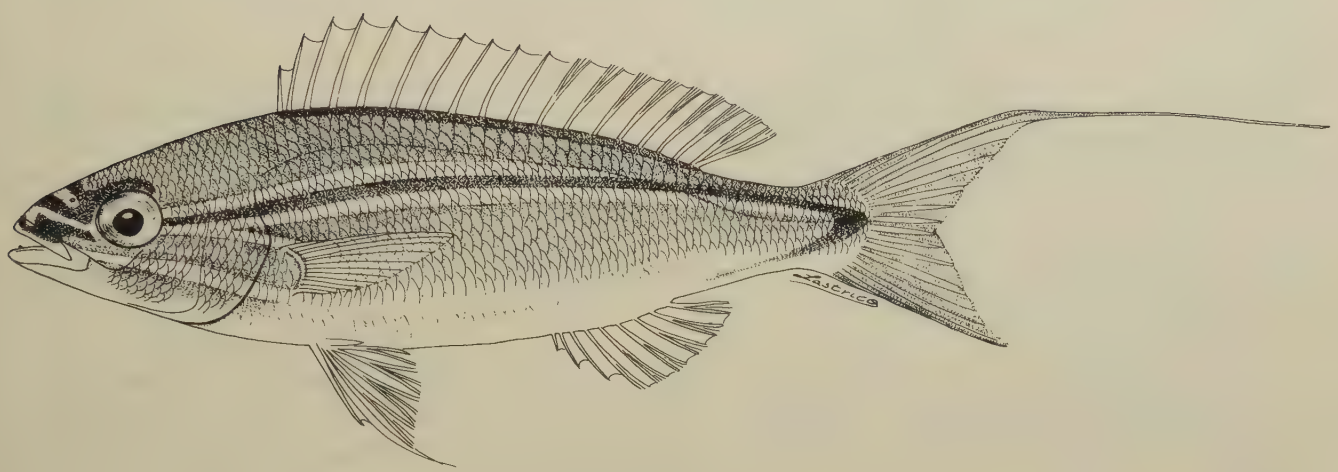


Fig. 155

Diagnostic Features: Snout length greater than diameter of eye; head scales reaching forward to or almost to level of posterior nostrils; suborbital naked; lower limb of preopercle naked; lateral-line scales 46 to 48 (usually 46 or 47); pectoral-fin rays ii, 14 or 15; pelvic fins short, not reaching to level of anus; caudal fin forked, upper lobe produced into a very long trailing filament. **Colour;** pale brownish on back; lower part of body whitish; a blue stripe along base of dorsal fin; a yellow stripe from behind eye, gradually arching on back and terminating in a black spot on upper caudal peduncle; a narrow blue line running through yellow stripe, this line convergent with a blue line from origin of anal fin, both lines meeting at an acute angle behind black spot on caudal peduncle; three bluish stripes across snout, first joining eyes behind nostrils, second in front of nostrils, third from eye to tip of snout; interspaces between stripes yellow; a yellow stripe from behind eye to upper base of pectoral fin; a yellow stripe running from middle of upper lip, beneath eye to below pectoral fin; dorsal fin lemon-yellow with a pale blue submarginal stripe; caudal fin pinkish, filament yellowish-brown.

Geographical Distribution: Northeastern Australia, southern Papua New Guinea, Solomon Islands (Fig. 156).

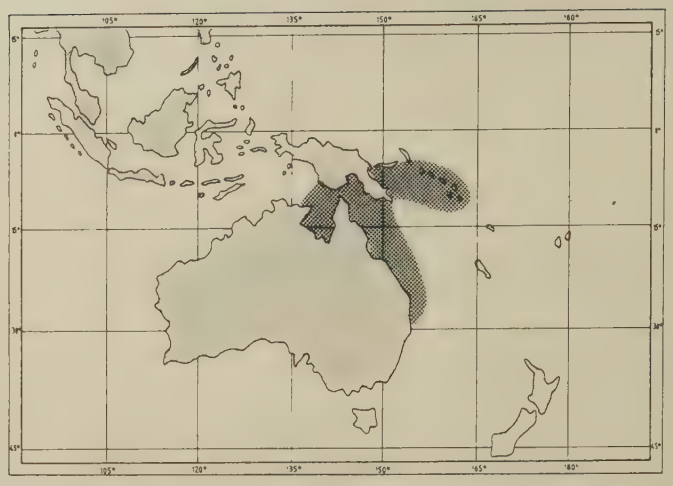


Fig. 156

Habitat and Biology: A benthic species found close to reefs. Food consists of small fishes, crustaceans and polychaetes.

Size: Maximum size is 20 cm SL, commonly 15 cm SL.

Interest to Fisheries: Appears occasionally in small numbers in local markets. Taken by handline by recreational fishermen in southern Queensland, Australia. No major fishery exists.

Local Names: AUSTRALIA: Long-tail perch (North Queensland); Blue-banded whiptail, butterfly bream, rainbow paradise fish, china fish (Queensland).

Literature Grant (1982, as ***P. setosus***).

Remarks: This species has been previously confused by most authors with ***Pentapodus setosus***. ***P. paradiseus*** differs from ***P. setosus*** in having, in addition to 2 blue stripes across the snout, a blue stripe joining the eyes behind the nostrils.

Pentapodus porosus (Valenciennes, 1830) | Fig. 157, Plate V, f | **NEMIP Pent 6**

Pentapus porosus Valenciennes in C. & V., 1830b, Hist. nat. poiss., 6: 267 pl. 156 (no locality given - probably Shark Bay, W. Australia).

Synonyms: ***Maenoides? auro-frenatus*** Richardson (1843b).

FAO Names: En - Northwest Australian whiptail.

Fig. 157

Diagnostic Features: Snout length greater than diameter of eye; head scales reaching forward to or almost to level of posterior nostrils; suborbital naked; lower limb of preopercle naked; lateral-line scales 46 to 48 (usually 46 or 47); pectoral-fin rays ii, 14 or 15; pelvic fins short, not reaching near level of anus; caudal fin forked, upper and lower lobes pointed, more or less equal in length, no filamentous extension to the upper caudal fin lobe. **Colour**: pale brownish on back; lower part of body whitish; a blue stripe along base of dorsal fin; a yellow stripe from behind eye, gradually arching on back and terminating in a black spot on upper caudal peduncle; a darker brown stripe below yellow stripe; a narrow blue line bordering yellow stripe above; this line convergent with a blue line from behind anal fin, both lines meeting at an acute angle behind black spot on caudal peduncle; three bluish stripes across snout, first joining eyes behind nostrils, second in front of nostrils, third from eye to tip of snout; interspaces between stripes yellow; a yellow stripe from behind eye to upper base of pectoral fin; a yellow stripe running from middle of upper lip, beneath eye to below pectoral fin; dorsal fin pale lemon yellow; caudal fin tinged bluish or pinkish.

Geographical Distribution: Northwestern Australia and Aru Islands (Fig. 158).

Habitat and Biology: A benthic species found close to reefs in offshore waters.

Size: Maximum size is 23 cm SL, commonly 15 cm SL.

Interest to Fisheries: Trawled in small numbers in offshore water, or taken by handline close to reefs. No major fishery exists.

Local Names: AUSTRALIA: Northwest whiptail, False whiptail.

Fig. 158

Literature: Gloerfelt-Tarp & Kailola (1984); Sainsbury et al. (1984); Allen & Swainston (1988).

Remarks: This species closely resembles ***Pentapodus setosus*** and ***P. paradiseus***. It differs from both these species, however, in lacking a filamentous extension to the upper lobe of the caudal fin.

Pentapodus setosus (Valenciennes, 1830) | Fig. 159, Plate V, g | **NEMIP Pent 7**

Pentapus setosus Valenciennes in C. & V., 1830b, Hist. nat. poiss., 6: 270 (Batavia).

Synonyms: ***Dentex filiformis*** Seale (1909).

FAO Names: En - Butterfly whiptail.

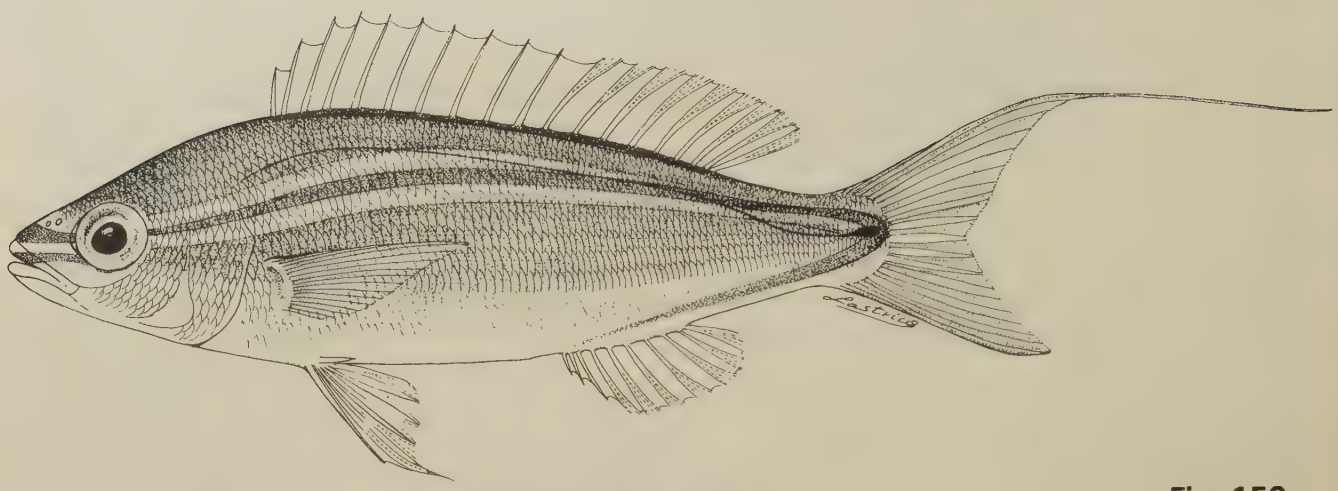


Fig. 159

Diagnostic Features: Snout length greater than diameter of eye; head scales reaching forward to between level of anterior margin of eyes and posterior nostrils; suborbital naked; lower limb of preopercle naked; lateral-line scales 46 to 48 (usually 46 or 47); pectoral-fin rays ii, 14 or 15 (usually ii, 14); pelvic fins short, not reaching level of anus; caudal fin forked, upper lobe produced into a very long trailing filament. **Colour:** pale brownish on back; lower part of body whitish; a blue stripe along base of dorsal fin; a yellow stripe from behind eye, gradually arching on back and terminating in a black spot on upper caudal peduncle; a narrow blue line running through yellow stripe, this line convergent with a blue line from origin of anal fin, both lines meeting at an acute angle behind black spot on caudal peduncle; two bluish stripes across snout, first from middle of eye to tip of snout, second from upper lip to lower margin of eye; top of snout dusky; caudal fin pinkish, filament pinkish-brown.

Geographical Distribution: Philippines, South China Sea, Singapore, Indonesia (Fig. 160).

Habitat and Biology: A benthic species, inhabiting offshore waters. Juveniles occur close to reefs. Food consists of small crustaceans.

Size: Maximum size is 17.5 cm SL, commonly 15 cm SL.

Interest to Fisheries: Trawled in fair numbers in the South China Sea and outer Gulf of Thailand. Also taken by bamboo stake trap (Thailand). Not highly rated as food and brings a low price. No major fishery exists. Used in fish balls, in fish meal, fried and as duck food.

Fig. 160

Local Names: PHILIPPINES: Silay, Salingukod (Visayan); MALAYSIA: Anjang-anjang, Seninching; INDONESIA: Empase, Krisi (Java), Krisi (W. Java); JAPAN: Batabia-kitsune; THAILAND: Pla Sai Khao.

Literature: Rau and Rau (1980); Kyushin et al. (1982); Tan et al. (1982); Gloerfelt-Tarp & Kailola (1984).

Pentapodus sp. | Fig. 161, Plate V, h | **NEMIP Pent 8**

Undescribed species

Synonyms: None.

FAO Names: **En** - Yellow-striped whiptail.

Fig. 161

Diagnostic Features: Snout length about equal to diameter of eye; head scales reaching forward to between level of anterior margin of eye and posterior nostrils; suborbital naked or with a small patch of scales beneath the eye; lower limb of preopercle with 2 or 3 scale rows; lateral-line scales 42 to 48 (usually 46 or 47); pectoral-fin rays ii, 13 to 16 (usually ii, 14 or 15); pelvic fins moderately long, reaching to or just short of level of anus; caudal fin forked, lobes more or less equal in length. **Colour:** body pale blue, whitish on ventral surface; narrow pale yellow band extending along back above lateral line, from behind eye to posterior end of dorsal fin (faded or absent in larger specimens); a second broader pale yellow band extending midlaterally along body from behind eye to caudal peduncle (fading beneath soft dorsal fin in larger specimens); a blue band from tip of snout to middle of anterior margin of eye; a second blue band from upper lip, passing under anteroventral margin of eye and fading on preopercle (bands on the snout not apparent in Australian specimens); interspace between bands on snout pale yellow; a pearly-blue band on ventral surface from behind pelvic fins to caudal peduncle present in larger specimens; all fins pale pinkish (some specimens from Fiji and Tonga with outer portion of upper lobe of caudal fin blackish, possibly a male sexual colour pattern).

Geographical Distribution: Taiwan, eastern Indonesia (Ambon), Papua New Guinea, eastern Australia, New Caledonia, Fiji, Tonga and Samoa (Fig. 162).

Habitat and Biology: A benthic species inhabiting sand bottoms adjacent to coral reefs.

Size: Maximum size is 16 cm SL, commonly 10 cm SL.

Interest to Fisheries: Appears occasionally in small numbers in local markets. No major fishery exists.

Local Names: SAMOA: Tivao-sugale.

Literature: Fourmanoir & Laboute (1976, p 96 as ***P. nagasakiensis*** and ***P. microdon***).

Fig. 162

Remarks: This undescribed species is similarly coloured to ***P. caninus***, but differs notably in the extent of the scaled area on top of the head, which does not reach forward of the posterior nostril and lacks a naked wedge-shaped medial notch; and the caudal fin lobes are pointed rather than falcate.

Pentapodus trivittatus (Bloch, 1791)	Fig. 163, Plate VI, a	**NEMIP Pent 9**

Labrus trivittatus Bloch, 1791, Naturg. Ausländ. Fische, 5: 106, pl. 275 ("Japan").

Synonyms: ***Sparus vittatus*** Bloch, (1791); ?***Bodianus fischerii*** Lacépède, (1802); ***Bodianus decacanthus*** Lacépède (1802); ?***Pentapus unicolor*** Valenciennes in C. & V. (1830b); ***Heterodon zonatus*** Bleeker (1845) (nomen nudum); ***Heterognathodon xanthopleura*** Bleeker (1851a); ***Scolopsis elongatus*** Weber (1913); ***Pentapus pleurostictus*** Duncker & Mohr (1931).

FAO Names: En - Three-striped whiptail.

Fig. 163

Diagnostic Features: Snout length greater than diameter of eye (except in specimens smaller than 90 mm SL where the snout length is equal to or less than diameter of eye); head scales reaching forward to or just in front of level of anterior margin of eyes; suborbital naked except for a small patch of scales beneath eyes; lower limb of preopercle with 2 or 3 scale rows; lateral-line scales 42 to 46 (usually 42 to 44); pectoral-fin rays ii, 13 to 15 (usually ii, 14); pelvic fins moderately long, reaching almost to level of anus; caudal fin forked, lobes more or less equal in length. **Colour**: dark grey or olive-brown above, silvery-white below; a narrow silvery-white stripe middorsally from between eyes to origin of dorsal fin; a second broader silvery-white stripe from behind eye, arching on back and terminating at end of dorsal fin; a third broad silvery-white stripe from lower part of eye to base of caudal fin, this stripe widest behind pectoral fin; a narrow silvery white stripe joining eyes across snout just behind nostrils; base of pectoral fin with a black bar; fins transparent, dorsal and anal fins with pale blue margins.

Geographical Distribution: Solomon Islands, New Guinea, western Caroline Islands (Palau, Yap), Philippines, East Malaysia, Indonesia, Singapore (Fig. 164).

Fig. 164

Habitat and Biology: A benthic species, common in shallow sandy rubble and coral reef areas, in depths to 15 m. Often occurs in aggregations. Food consists of small fishes, crustaceans and polychaetes.

Size: Maximum size is 19 cm SL, commonly 15 cm SL.

Interest to Fisheries: Appears in small numbers in local markets. No major fishery exists.

Local Names: INDONESIA: Mahung, Krisi (Java), Gurisi (W. Java). MALAYSIA: Pasir-pasir, Anjang-anjang. PHILIPPINES: Silay (Cuyonin), Salingukod (Visayan), Isdang bato (Tagalog). PAPUA NEW GUINEA: Kinkin (Port Moresby).

Literature: The following authors have reported this species as ***P. caninus***: Rau and Rau (1980); Schroeder (1980); Myers (1989). Gloerfelt-Tarp & Kailola (1984) correctly use the name ***P. trivittatus***.

Remarks: This species has previously been misidentified as ***Pentapodus caninus*** by most authors.

Pentapodus vitta Quoy & Gaimard, 1824	Fig. 165, Plate VI, b	**NEMIP Pent 10**

Pentapodus vitta Quoy & Gaimard, 1824, Voy. "Uranie", Zool.: 294, pl. 44 fig. 4 (Shark Bay, W. Australia).

Synonyms: ***Pentapus iris*** Valenciennes in C. & V. (1830b); ***Pentapus peronii*** Valenciennes in C. &. V. (1830b); ***Smaris porosus*** Richardson in Stokes (1846).

FAO Names: En - Striped whiptail.

Fig. 165

Diagnostic Features: Snout length equal to or greater than diameter of eye; head scales reaching forward to or just in front of level of anterior nostrils; scaled area between nostrils with a distinct naked wedge-shaped notch; suborbital naked; lower limb of preopercle naked; lateral-line scales 45 to 50 (usually 47 to 49); pectoral-fin rays ii, 14 or 15 (usually ii, 15); pelvic fins moderately long, reaching to or just before level of anus; caudal fin forked, lobes more or less equal in length. **Colour**: body silvery-white; a narrow dark brown stripe, edged with turquoise on either side of dorsal midline, from above eyes to caudal peduncle; a second dark brown stripe from tip of snout, through eye and along upper half of body, terminating at base of caudal fin; this stripe broader on posterior part of body and also edged with turquoise; fins transparent; dorsal and anal fins with a narrow, pale turquoise submarginal stripe.

Geographical Distribution: Western Australia: Dampier Archipelago to King George Sound (Fig. 166).

Fig. 166

Habitat and Biology: A benthic species, inhabiting sea grass beds and reef areas.

Size: Maximum size is 21 cm SL, commonly 15 cm SL.

Interest to Fisheries: Occasionally taken by handline. No major fishery exists.

Local names: AUSTRALIA: Butterfish, Western butterfish (Western Australia).

Literature: Gloerfelt-Tarp & Kailola (1984); Allen & Steene (1987); Allen & Swainston (1988).

Scaevius Whitley, 1947

NEMIP Scaev

Genus: ***Scaevius*** Whitley, 1947, Aust. zool., 11: 142. Type species, ***Scaevius nicanor*** Whitley, 1947 [= ***S. milii*** (Bory de Saint-Vincent, 1823)], by original designation.

Synonyms: None.

A single species in the genus - see ***Scaevius milii***.

Scaevius milii (Bory de Saint-Vincent, 1823) Fig. 167, Plate VI, c

NEMIP Scaev 1

Cantharus Milii Bory de Saint-Vincent, 1823, Dict. clas. d'hist. nat., 3: 160 (Shark Bay, Western Australia).

Synonyms: ***Scolopsis longulus*** Richardson (1842); ***Maenoides? cyano-taeniatus*** Richardson (1843b); ***Scaevius nicanor*** Whitley (1947).

FAO Names: En - Green-striped coral bream.

Fig. 167

Diagnostic Features: Body moderately slender, laterally compressed. Teeth villiform or small, conical, in tapering bands in both jaws; anterior teeth in lower jaw slightly enlarged; a row of small canines posteriorly on each side of lower jaw. Gill rakers short and stubby, 9 to 12 on first arch. Pectoral fins short, not reaching to level of anus; pectoral-fin rays ii, 14 to 17 (usually ii, 15); pelvic fins long, reaching to or beyond level of anus; second anal spine usually longer and more robust than first or third; caudal fin emarginate; scales on top of head not reaching to level of eyes; snout, suborbital, interorbital, and temporal parts of head naked; posterior margin of suborbital denticulate, a small spine in upper corner; 5 or 6 transverse rows of cheek scales; preopercle scaly, lower limb of preopercle naked; posterior margin of preopercle serrate; opercle scaly; upper margin of opercle with a small, flat, rounded spine; lateral-line scales 40 to 45, 2½ to 3 transverse scale rows above lateral line, 14 to 16 rows

below. **Colour**: dark olive on top of head, paler on back, ventral surface white; a whitish stripe from above eye to end of dorsal fin; a pale blue stripe from behind eye to upper part of caudal peduncle; a second slightly broader, whitish stripe from behind eye almost to upper base of pectoral fin, thence along body to middle of caudal-fin base; a third, pale blue stripe from below eye to base of pectoral fin; interspaces between these stripes brownish-orange; 2 blue stripes on snout; the first joining eyes through nostrils; the second across front of snout; 2 narrow blue lines below eye crossing suborbital; a black spot on upper base of caudal fin.

Geographical Distribution: Northwestern Australia: Gulf of Carpentaria to Abrolhos Islands (Fig. 168).

Fig. 168

Habitat and Biology: A benthic species, very common on shallow inshore reefs and adjacent sand or mud bottoms, in depths down to 20 m. Feeds on small fishes and benthic invertebrates.

Size: Maximum size is 20 cm SL, commonly 15 cm SL.

Interest to Fisheries: Unimportant as a food fish. No major fishery exists.

Local Names: AUSTRALIA: Jurgen (Western Australia).

Literature: Sainsbury et al.(1984); Allen & Swainston (1988).

Remarks: This species has been commonly referred to as ***Scaevius nicanor*** Whitley, but ***S. milii*** is an older name.

Scolopsis Cuvier, 1815

NEMIP Scol

Genus: ***Scolopsis*** Cuvier, 1815, Mém. Mus. Hist. Nat., Paris., 1: 361. Type species "le curite de Russel" (= ***Scolopsides kurita*** Cuvier in C. & V., 1830a), by subsequent designation of Jordan (1917).

Synonyms: Genus ***Scolopsides*** Cuvier, 1829; Subgenus ***Ctenoscolopsis*** Fowler, 1931b.

Diagnostic Features: Small to medium-sized fish with a slender or moderately deep, laterally compressed body. Teeth villiform or small, conical, in tapering bands in both jaws; canine teeth absent. Gill rakers short and stubby, 8 to 12 on first arch. Pectoral fins short to moderately long, with 2 unbranched and 12 to 17 branched rays; second anal spine usually longer and more robust than first or third; caudal fin emarginate or forked; upper lobe and/or lower lobe of caudal fin pointed, falcate or produced to form short filamentous extensions. Body covered with ctenoid scales; scales on top of head reaching forward to level of middle of eyes, to level of nostrils or to in front of nostrils; suborbital naked, with a large backwardly pointing spine and a series of smaller spines or serrations on its posterior margin; a small antrorse spine beneath eye in some species; 4 to 7 transverse rows of cheek scales, lower limb of preopercle naked or scaly; posterior margin of preopercle serrate or spinous; opercle scaly; upper margin of opercle with a small, flat embedded spine. Lateral line 35 to 49, 3 to 5½ transverse scale rows above lateral line, 12 to 18 rows below. **Colour**: extremely variable.

Biology, Habitat and Distribution: Benthic, usually occurring on reefs or on sandy or muddy bottoms close to reefs, in depths down to 60 m; either solitary or in aggregations. ***Scolopsis*** species feed primarily on small crustaceans on the bottom. Juveniles of several species are Batesian mimics of other fishes. Some species are protogynous hermaphrodites.

Geographical Distribution: Widespread throughout the Indo-West Pacific region, in tropical and subtropical waters.

Interest to Fisheries: No major fishery exists for species of ***Scolopsis***, although ***S. taeniopterus*** is trawled in small quantities in the South China Sea and Gulf of Thailand. Small numbers of other species are taken by artisanal fishermen mainly by handline. Some of the smaller species of ***Scolopsis*** are also captured live for the aquarium trade. Marketed fresh (whole), dry-salted, dry-smoked and as fish balls and fish cakes.

Literature: Fowler (1931b); Weber & de Beaufort (1936); Wongratana (1978).

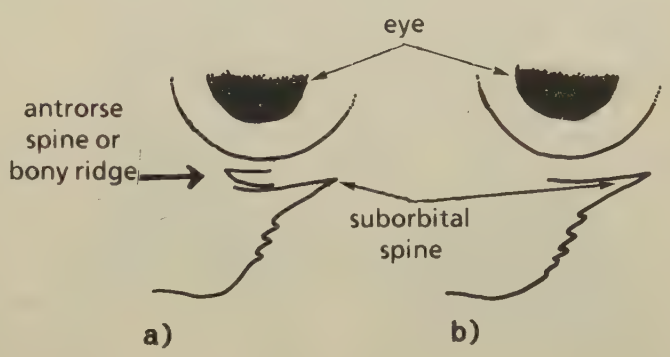
Remarks: Some authors have included ***Parascolopsis*** in the genus ***Scolopsis***, but they are retained here as separate taxa on the basis of differences in jaw structure, development of the infraorbital bones, number of epipleural ribs and degree of development of the second anal spine.

Key to the Species of *Scolopsis*

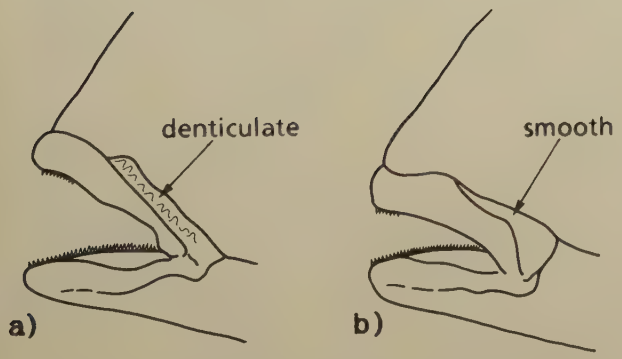
1a. Small antrorse spine or bony ridge present below eye (Fig. 169a)

2a. Maxillary denticulate on its external edge (Fig. 170a) (Andaman Sea, W. Pacific) . . . . . ***S. ciliatus*** (Fig. 171, Plate VII, b)

2b. Maxillary smooth along its external edge (Fig. 170b)



suborbital bond **Fig. 169**



outer surface of maxillary bone **Fig. 170**

S. ciiatus **Fig. 171**

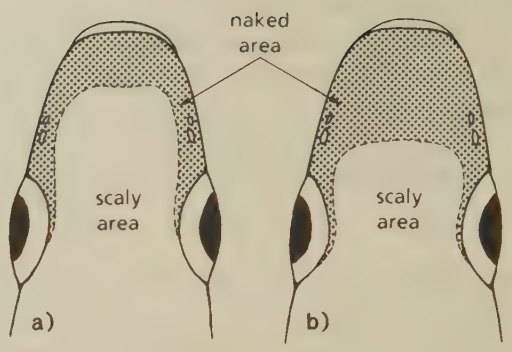
3a. Scales on top of head reaching forward to between level of snout and anterior nostril (Fig. 172a)

4a. Body depth 2.5 to 3.0 in SL; pectoral fins reaching to level of anus; anterior part of anal fin black (W. Pacific and E. Indian Ocean; Fiji to Laccadive Is) . . . . . ***S. bilineatus*** (Fig. 173, Plate VI, f)

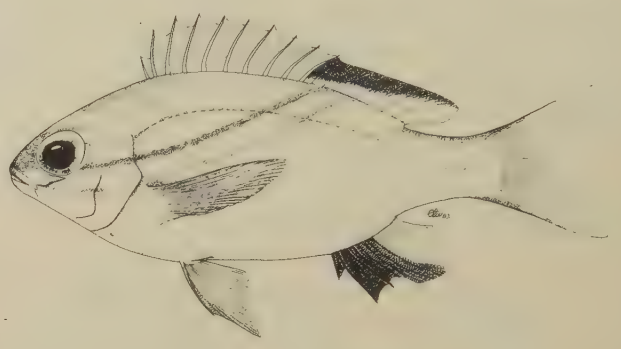
4b. Body depth 2.0 to 2.6 in SL; pectoral fins not reaching to level of anus; anterior part of anal fin not black (Indo-W. Pacific) . . . . . ***S. vosmeri*** (Fig. 174, Plate VIII, g)

3b. Scales on top of head not extending forward to level of posterior nostril (Fig. 172b) (W. Pacific and E. Indian Ocean: Solomon Is to Maldives) . . . ***S. xenochrous*** (Fig. 175, Plate VIII, h)

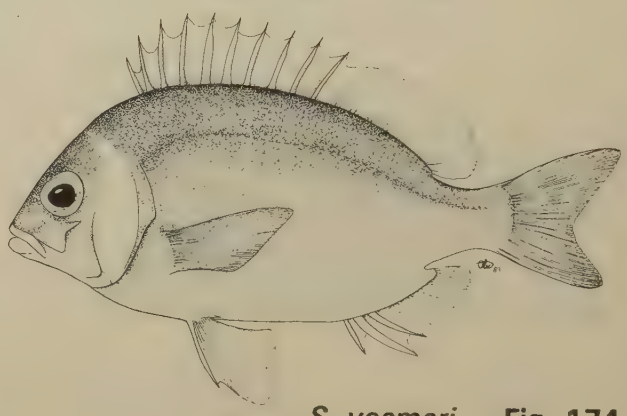
1b. Small antrorse spine or bony ridge below eye absent (Fig. 169b)



top of head, showing forward extent of scales **Fig. 172**



S. bilineatus **Fig. 173**



S. vosmeri **Fig. 174**

S. xenochrous **Fig. 175**

5a. Temporal region naked (Fig. 176) (Solomon Is, N. New Guinea, Sulawesi) . . . . . ***S. temporalis*** (Fig. 177, Plate VIII, e)

5b. Temporal region scaled

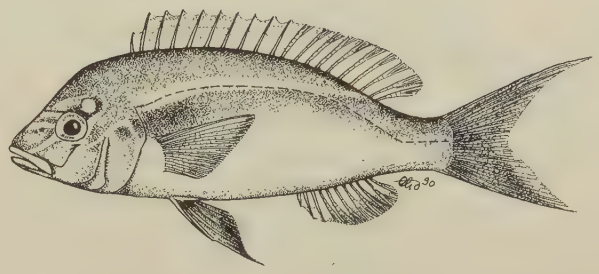
6a. Head scales reaching forward only to level of mid-pupil (Fig. 178a)

7a. Lateral-line scales 41 to 43 (rarely 44); lower limb of preopercle scaly (W. Pacific: Samoa to Philippines) . . . . ***S. trilineatus*** (Fig. 179, Plate VIII, f)

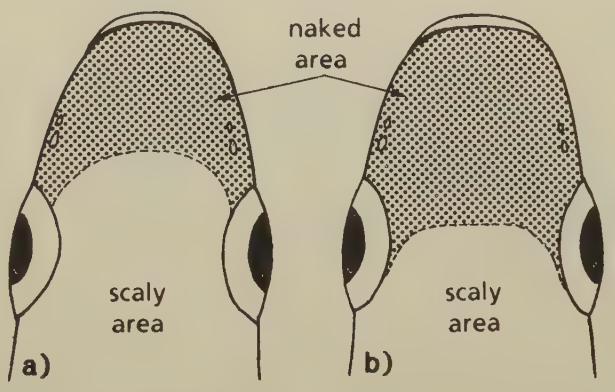
7b. Lateral-line scales 45 to 47; lower limb of preopercle naked (W. Indian Ocean and Andaman Sea) . . . . . ***S. ghanam*** (Fig. 180, Plate VII, e)

6b. Head scales reaching forward to or in front of level of anterior margin of eye (Fig. 178b)

extent of scales on head **Fig. 176**

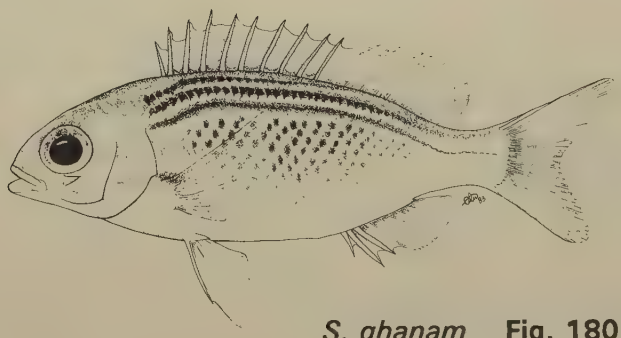


S. temporalis **Fig. 177**



top of head, showing forward extent of scales **Fig. 178**

S. trilineatus **Fig. 179**



S. ghanam **Fig. 180**

8a. Lateral-line scales 37 to 39 (W. Pacific) . . . . . ***S. margaritifer*** (Fig. 181, Plate VII, h)

8b. Lateral-line scales 42 to 48

9a. Pectoral-fin rays ii, 14; 3 scale rows between lateral line and dorsal origin; colour pattern consisting of 3 irregular dark stripes horizontally on upper half (W. Pacific and Cocos-Keeling Is) . . . . . ***S. lineatus*** (Fig. 182, Plate VII, f)

9b. Pectoral-fin rays ii, 15 to 16; 4 to 5 scale rows between lateral line and dorsal origin; colour pattern not as above

10a. Large, dark ovoid spot, transected by lateral line, on upper part of body beneath middle of dorsal fin (W. Indian Ocean: Bay of Bengal) .. . . . . ***S. bimaculatus*** (Fig. 183, Plate VII, a)

10b. No dark ovoid spot on upper part of body

S. margaritifer **Fig. 181**

S. lineatus **Fig. 182**

S. bimaculatus **Fig. 183**

11a. Lower margin of eye distinctly below line from snout to upper pectoral base (Fig. 184a) (W. Indian Ocean: Chagos Is, Seychelles, Mauritius, Réunion, Madagascar) . ***S. frenatus*** (Fig. 185, Plate VII, c)

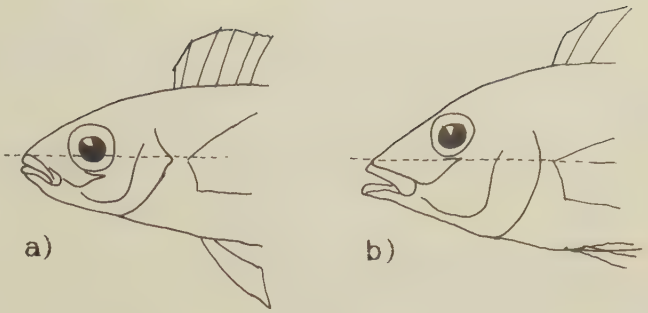
11b. Lower margin of eye tangent to or above a line from snout to upper pectoral base (Fig. 184b)

12a. Head scales reaching forward to or nearly to level of posterior nostril

13a. Dusky stripe present above lateral line (Persian Gulf, Gulf of Oman, Red Sea, Gulf of Aden) . . . . . ***S. taeniatus*** (Fig. 186, Plate VIII, c)

13b. Dusky stripe above lateral line absent

14a. Bony opercular ridge naked or nearly so; lower limb of preopercle naked or nearly so (Fig. 187a) (W. Pacific: N. Australia to Philippines) . . . . . ***S. taeniopterus*** (Fig. 188, Plate VIII, d)

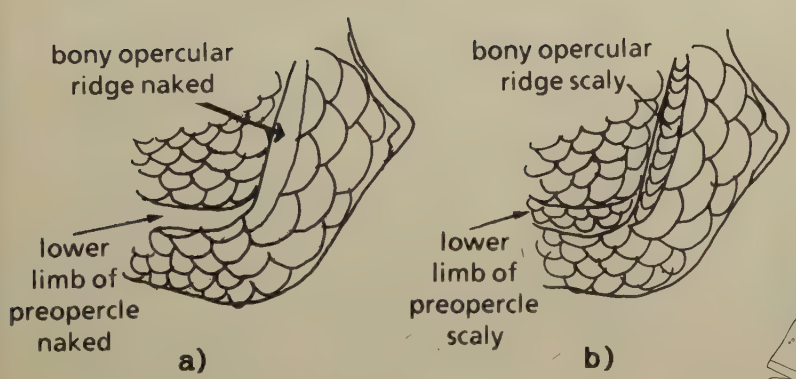


position of eye relative to a line from tip of snout to upper pectoral fin base

Fig. 184

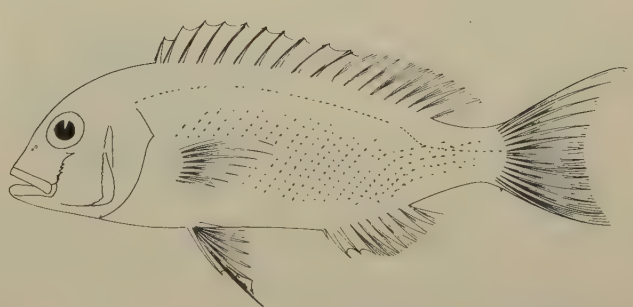
S. frenatus **Fig. 185**

S. taeniatus **Fig. 186**



scales on preopercle and opercle

Fig. 187



S. taeniopterus **Fig. 188**

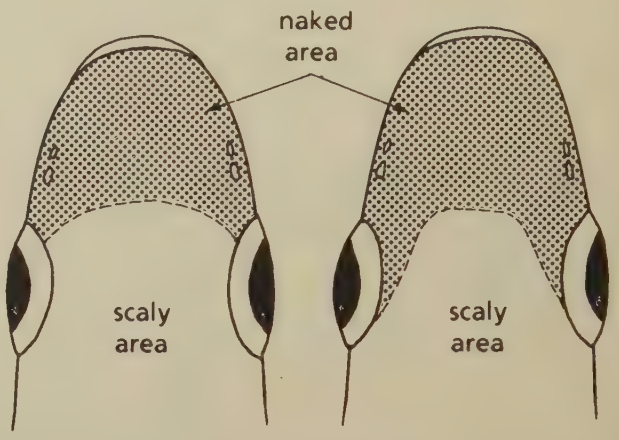
14b. Bony opercular ridge scaly; lower limb of preopercle with 1 or 2 scale rows (Fig. 187b) (W. Pacific: N. Australia to Philippines) . . . . . ***S. affinis*** (Fig. 189, Plate VI, d)

12b. Head scales not reaching forward to level of posterior nostril

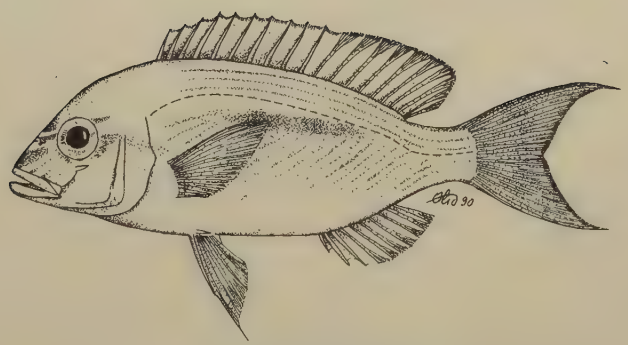
15a. Transverse scale rows between lateral line and first dorsal spine 4; patch of scales on top of head truncated anteriorly (Fig. 190a) (Southern Indonesia, Sri Lanka, Maldives) . . . . . ***S. auratus*** (Fig. 191, Plate VI, e)

15b. Transverse scale rows between lateral line and first dorsal spine 5 or 6; scales on top of head not truncated anteriorly (Fig. 190b) (W. Pacific and E. Indian Ocean) . . . . . ***S. monogramma*** (Fig. 192, Plate VIII, b)

S. affinis **Fig. 189**



shape of anterior margin of head scales **Fig. 190**



S. monogramma **Fig. 192**

S. auratus **Fig. 191**

Scolopsis affinis Peters, 187 | Fig. 193, Plate VI, d | NEMIP Scol 9

Scolopsis affinis Peters, 1877, Monatsber. Akad. Berlin, 1876: 832 (New Britain, New Ireland).

Synonyms: None.

FAO Names: En - Peters' monocle bream.

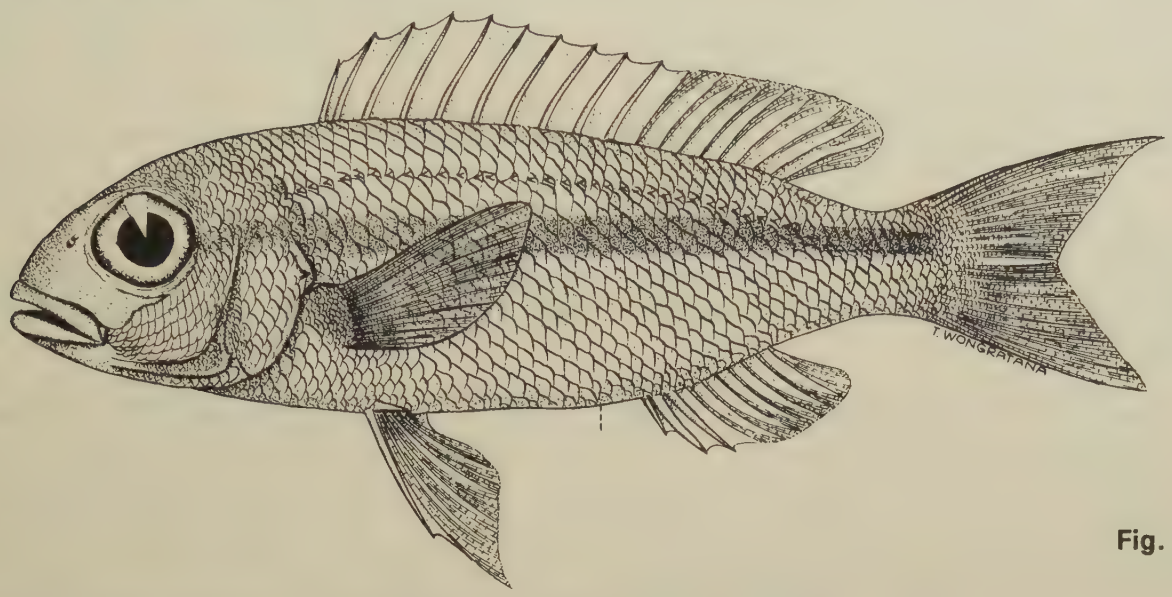


Fig. 193

Diagnostic Features: Body depth 2.9 to 3.3 in SL; snout length about equal to diameter of eye; head scales reaching forward to level of posterior nostrils; lower limb of preopercle scaly; antrorse suborbital spine absent; suborbital depth 1.7 to 2.9 in eye diameter; lateral-line scales 43 to 46; pectoral-fin rays ii, 14 to 16 (usually ii, 14 or 15); pelvic fins long, reaching to or beyond level of anus; caudal fin forked, larger specimens with upper and lower lobes falcate. **Colour:** body silvery-white, greyish on back above lateral line; a broad yellow midlateral stripe (yellowish in larger specimens) from behind eye to caudal peduncle; top of head and snout dusky grey; an indistinct bluish stripe between eyes; a narrow white stripe from middle of upper lip to below eye; caudal fin yellow, with a narrow pale blue margin. Juveniles with dusky brown stripe on either side of dorsal midline, and dusky brown midlateral stripe, yellowish above anteriorly.

Geographical Distribution: Western Pacific Ocean, including Ryukyu Islands, Philippines, South China Sea, Indonesia, New Guinea, Solomon Islands, northeastern Australia, and the Andaman Sea (Fig. 194).

Habitat and Biology: A benthic species, found on sand or mud bottoms close to reefs, in depths to 60 m. Occurs solitary or in small aggregations.

Size: Maximum size is 19.5 cm SL, commonly 15 cm SL.

Fig. 194

Interest to Fisheries: Appears occasionally in small numbers in local markets. No major fishery exists.

Local Names: PHILIPPINES: Silay, Buruba, Tagisang lawin.

Literature: Masuda et al. (1975, 1984); Rau & Rau (1980, as ***S. personatus***); Gloerfelt-Tarp & Kailola (1984); Myers (1989, as ***S. monogramma***).

Remarks: This species has been incorrectly referred to as ***S. personatus*** (= ***S. auratus***) by some authors.

Scolopsis auratus (Park, 1797) Fig. 195, Plate VI, e **NEMIP Scol 3**

Perca aurata Park, 1797, Trans. Linn. Soc., 3: 35 (Bengkulu, Sumatra).

Synonyms: ***Lutjanus aureovittatus*** Lacépède (1802); ***Scolopsides personatus*** Cuvier in C. & V. (1830a).

FAO Names: En - Yellowstripe monocle bream. **Fr** - Mamila à bande dorée. **Sp** - Besugato de banda dorada.

Fig. 195

Diagnostic features: Body depth 2.9 to 3.1 in SL; snout length about equal to or a little greater than diameter of eye; head scales reaching forward to or just behind level of anterior margin of eye; scaly area between eyes truncated anteriorly; lower limb of preopercle scaly; antrorse suborbital spine absent; suborbital depth 1.8 to 2.6 in eye diameter; lateral-line scales 46 to 48; pectoral-fin rays ii, 15 or 16, (Usually ii, 15); pelvic fins long, reaching to or just beyond level of anus; caudal fin forked. **Colour:** body silvery-white, dusky blue on back; a broad golden-yellow midlateral stripe from behind eye to base of caudal fin; snout dusky; a narrow pale bluish stripe joining eyes behind nostrils; caudal fin golden-yellow.

Geographical Distribution: Eastern Indian Ocean, including the Maldives, Sri Lanka, and southern Indonesia (Fig. 196).

Habitat and Biology: A benthic species, found close to reefs.

Size: Maximum size is 21 cm SL, commonly 18 cm SL.

Interest to Fisheries: Appears occasionally in small numbers in local markets. No major fishery exists.

Fig. 196

Local names: INDONESIA: Pasir-pasir.

Literature: Fischer & Bianchi (1984); Gloerfelt-Tarp & Kailola (1984).

Remarks: This species has been reported by most authors under the name ***S. personatus***, but ***S. auratus*** is an older name.

Scolopsis bilineatus (Bloch, 1793) | Fig. 197, Plate VI, f-g-h | **NEMIP Scol 4**

Anthias bilineatus Bloch, 1793, Naturges. Ausländ. Fische, 7: 3, pl. 325, fig. 1 (Japan).

Synonyms: ***Lutjanus ellipticus*** Lacépède (1802); ***Perca frenata*** Günther (1859); ***Scolopsis bleekeri*** Günther (1859).

FAO Names: **En** - Two-lined monocle bream; **Fr** - Mamila griffée. **Sp** - Besugato rayado.

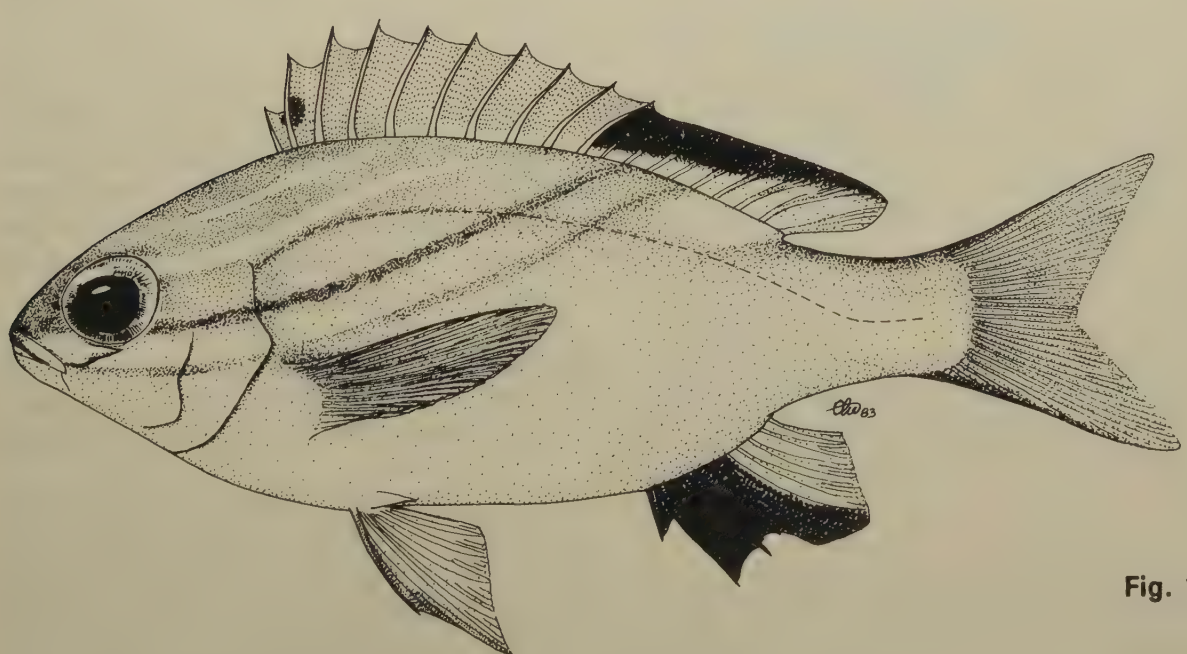


Fig. 197

Diagnostic Features: Body depth 2.5 to 3.0 in SL; snout length less than diameter of eye; head scales reaching to or just in front of anterior nostrils; lower limb of preopercle scaly; antrorse suborbital spine present beneath eye; suborbital depth 2.8 to 5.6 in eye diameter; lateral-line scales 43 to 47 (usually 45 or 46); pectoral-fin rays ii, 14 to 16 (usually ii, 15); pelvic fins long, reaching to or almost to level of origin of anal fin; caudal fin forked. **Colour**: head and upper part of body olive or greyish-brown, pearly-white below; a dark red-edged pearly-white stripe ascending from mouth to base of the soft dorsal fin; two narrow yellow stripes on head; the first from top of snout through upper part of eye to beneath middle of spinous dorsal fin; the second, parallel to first, from above eye to beneath dorsal fin origin; a yellow middorsal stripe from above eyes along base of dorsal fin; a whitish patch just below base of posterior half of soft dorsal rays; spinous dorsal fin yellow, soft dorsal with anterior half deep red or black, remaining part transparent; anterior half of anal fin deep red or black, remaining part transparent; caudal fin transparent, outer caudal rays reddish. Juveniles with 3 dark brown stripes on upper part of body, interspaces between stripes yellow; ventral half of body silvery-white (Plate VI, g); specimens from Fiji uniformly yellow, with only traces of dark stripes on upper part of body (Plate VI, h); black spot between first 4 dorsal spines.

Geographical Distribution: Eastern Indian Ocean from the Laccadive Islands, Sri Lanka, Andaman Sea, Western Australia, and the Western Pacific from the Ryukyu Islands to eastern Australia and eastwards to New Caledonia and Fiji (Fig. 198).

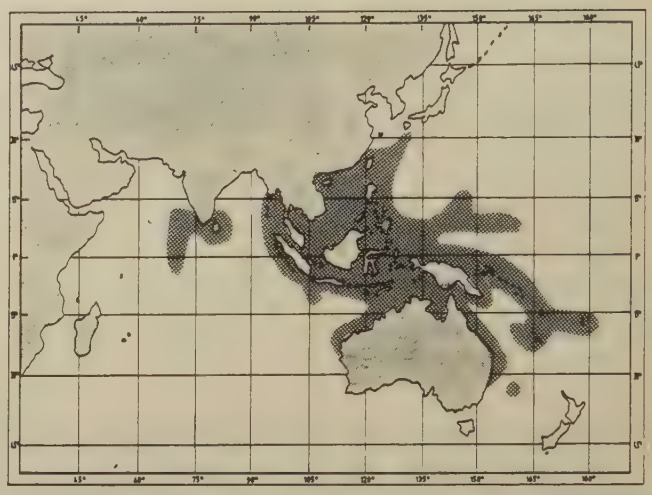


Fig. 198

Habitat and Biology: A benthic species, common on coral reefs, in depths to 20 m. Occurs solitary or in small aggregations. Feeds on small fishes and benthic invertebrates. A protogynous hermaphrodite. Juveniles appear to be Batesian mimics of poison-fanged blenniids (***Meiacanthus***).

Size: Maximum size is 15.5 cm SL, commonly 13 cm SL.

Interest to Fisheries: Appears occasionally in small numbers in local markets. Caught mainly by handline. Live specimens captured by hand net for the aquarium export trade in the Philippines. No major fishery exists.

Local Names: PHILIPPINES: Silay (Visayan), Buruba, Tagisang lawin (Tagolog). MALAYSIA: Timun-timun; INDONESIA: Pasir-pasir (W. Java), Kinolu pinhiti (Ceram - Wahai), Sidemo karang (Ambon), Aoloumang (Ambon - Hitu), Ija puti (Ambon - Luhu), Lisila (Saparua - Haria), Mata baban (Geser). PAPUA-NEW GUINEA: Wonano (Port Moresby). AUSTRALIA: Bridled monocle bream, bridled spine-cheek, yellow-finned spine-cheek (Queensland). THAILAND: Pla Sai Khao. LACCADIVE ARCHIPELAGO: Kolkodin (Bitra). JAPAN: Futasuji-tamagashira.

Literature: Masuda et al. (1975, 1984); Fourmanoir & Laboute (1976); Jones & Kumaran (1980); Rau & Rau (1980); Schroeder (1980); Grant (1982); Fischer & Bianchi (1984); Gloerfelt-Tarp & Kailola (1984); Shen (1984); Allen & Steene (1987); Allen & Swainston (1988); Myers (1989).

Scolopsis bimaculatus Rüppell, 1828 | Fig. 199, Plate VII, a | NEMIP Scol 5

Scolopsis bimaculatus Rüppell, 1828-31 (1828), Fische des Rothen Meers: 8, pl. 2, fig. 2 (Massowah, Red Sea).

Synonyms: None.

FAO Names: En - Thumbprint monocle bream. **Fr** - Mamila Saint Pierre. **Sp** - Besugato de San Pedro.

Fig. 199

Diagnostic Features: Body depth 2.6 to 3.3 in SL; snout length about equal to diameter of eye; head scales reaching forward to level of posterior nostrils; lower limb of preopercle scaly; antrorse suborbital spine absent; suborbital depth 1.5 to 4.4 in eye diameter; lateral-line scales 45 to 48 (usually 45 to 47); pectoral-fin rays ii, 15 to 17 (usually ii, 16); pelvic fins long, reaching to between level of anus and origin of anal fin; caudal fin forked. **Colour:** body pale grey, whitish on ventral surface; an elongate brownish blotch (or pair of blotches) on upper part of side, beginning beneath seventh or eighth dorsal spine and intersected by lateral line; a blue stripe joining eyes.

Geographical Distribution: Western Indian Ocean from Muscat to Delagoa Bay, Mozambique, including the Persian Gulf, Red Sea, Madagascar, Sri Lanka and the Bay of Bengal (Fig. 200).

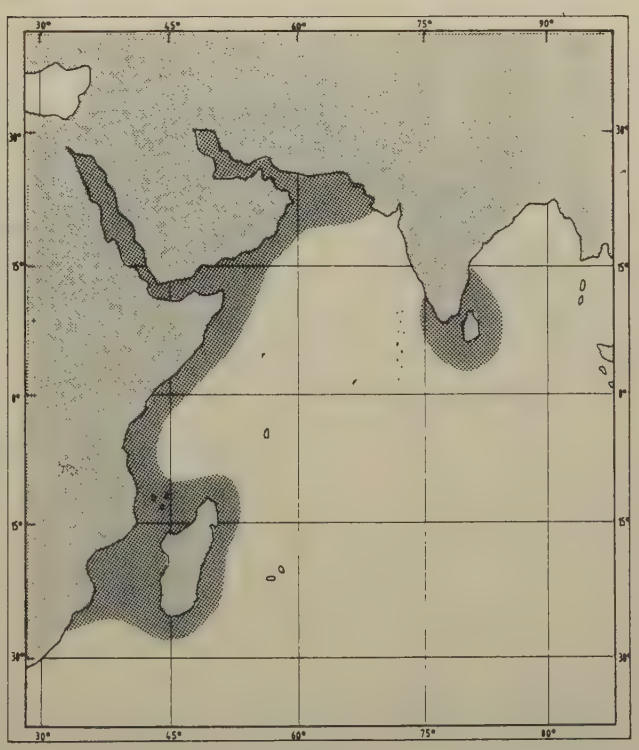


Fig. 200

Habitat and Biology: A benthic species, found in inshore waters usually on coral reefs or sand or mud bottoms close to reefs, in depths to 60 m. In Kenya, mature females occur all year round but there appear to be two peaks in spawning, in March to May and September to November (Nzoika, 1985b). ***S. bimaculatus*** feeds on crustaceans, molluscs, echinoderms, and fish.

Size: Maximum size is 25 cm SL, commonly 13 cm SL.

Interest to Fisheries: Taken by bottom trawls, handlines, traps and gill nets. An important artisinal catch species in Kenya. No major fishery exists.

Local Names: SRI LANKA: Pol ranna (Sinhalese). BAHRAIN: Ebzaymee. SOUTH AFRICA: Dubbelvek-stekelwang, double blotch spinecheek. MADAGASCAR: Ambity. TANZANIA: Sururu (Tanga), Changu-chole (Mafia).

Literature: Munro (1955); Randall et al. (1978); Fischer & Bianchi (1984); Bauchot & Bianchi (1984); Bianchi (1985a, 1985b); Al-Baharna (1986); Kuronuma & Abe (1986, as ***S. phaeops***); Smith & Heemstra (1986); Allen & Steene (1987).

Scolopsis ciliatus (Lacépède, 1802) | Fig. 201, Plate VII, b | **NEMIP Scol 10**

Holocentrus ciliatus Lacépède, 1802, Hist. nat. poiss., 4: 333 (no locality given).

Synonyms: ***Scolopsides lycogenis*** Cuvier in C. & V. (1830a); ***Lycogenis argyrosoma*** Kuhl & Van Hasselt in C. & V. (1830a) (name in synonymy); ?***Scolopsis specularis*** De Vis (1882); ***Scolopsis luzonia*** Jordan & Seale (1907).

FAO Names: En - Saw-jawed monocle bream.

Fig. 201

Diagnostic Features: Body depth 3.0 to 3.4 in SL; snout length a little less than diameter of eye; maxillary denticulate along its external edge; head scales reaching forward to or just in front of level of anterior nostrils; lower limb of preopercle scaly; antrorse suborbital spine present beneath eye; suborbital depth 2.7 to 5.0 in eye; lateral-line scales 41 to 43 (usually

43); pectoral-fin rays ii, 14 to 16 (usually 11, 15); pelvic fins long, reaching to or just beyond level of anus; caudal fin forked. **Colour**: body olive above, white below; a silvery-white stripe on the back beneath the dorsal fin; a row of golden-yellow spots midlaterally from behind tip of pectoral fin to caudal peduncle; caudal fin with upper and lower edges reddish.

Geographical Distribution: Andaman Sea and western Pacific, including the Ryukyu Islands, Philippines, Indonesia, Solomon Islands and Vanuatu (Fig. 202).

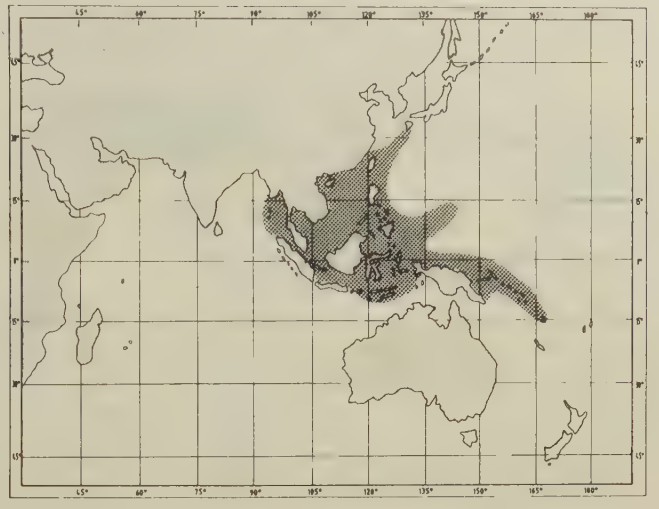


Fig. 202

Habitat and Biology: A benthic species, found on sandy bottoms close to coral reefs. Occurs often in small groups. Feeds on benthic invertebrates and small fishes.

Size: Maximum size is 13.5 cm SL, commonly 10 cm SL.

Interest to Fisheries: Appears occasionally in small numbers in local markets. Also taken incidentally by trawlers in the Gulf of Thailand. No major fishery exists.

Local Names: PAPUA NEW GUINEA: Matabibi (Port Moresby). PHILIPPINES: Silay sa bato (Visayan), Buruba, Tagisang lawin (Tagalog). INDONESIA: Kapa-kapa (Butan), Pasir-pasir (W. Java), Ranta pute (S. Celebes - Badjo), Mata pute (Muna), Palosi pinhiti (Ceram - Wahai), Sidemo (Ambon), Sasoi (Ambon - Hitu), Ija putilo ote (Ambon - Luhu), Kebinutu (Geser). THAILAND: Pla Sai Khao.

Literature: Fourmanoir & Laboute (1976); Rau & Rau (1980); Schroeder (1980); Gloerfelt-Tarp & Kailola (1984); Allen & Steene (1987); Myers (1989).

Scolopsis frenatus (Cuvier, 1830) — Fig. 203, Plate VII, c,d — **NEMIP Scol 6**

Scolopsides frenatus Cuvier in C & V., 1830a, Hist nat. poiss., 5: 343 (Seychelles, Mauritius).

Synonyms: ***Scolopsides phaeops*** Bennett (1832).

FAO Names: **En** - Bridled monocle bream. **Fr** - Mamila de Seychelles. **Sp** - Besugato de Seychelles.

Fig. 203

Diagnostic Features: Body depth 3.0 to 3.5 in SL; snout length about equal to diameter of eye; head scales reaching to between anterior margin of eyes and posterior nostrils; lower limb of preopercle naked; antrorse suborbital spine absent; suborbital depth 1.9 to 5.7 in eye; lateral-line scales 42 to 49 (usually 45 to 48); pectoral-fin rays ii, 15; pelvic fins long, reaching to or just beyond level of anus; caudal fin forked, lobes falcate, upper lobe slightly longer than lower lobe in larger specimens. **Colour:** blue or olive green on back, white below; a yellow stripe from top of snout, through upper part of eye and arching on back to upper part of caudal peduncle; this stripe edged dark green above, from behind eye to beneath third or fourth dorsal spine; a narrow yellow stripe from on top of head running along base of dorsal fin, this stripe disappearing with age; snout dusky; a narrow blue stripe from tip of snout to anteroventral edge of eye. Juveniles blue on upper half of body, white below; a narrow lemon-yellow stripe on either side of dorsal midline, and broader lemon-yellow stripe from top of snout to upper half of caudal peduncle (Plate VII, D).

Geographical Distribution: Western Indian Ocean, including the Seychelles, Chagos Archipelago, Mauritius, Réunion and Madagascar (Fig. 204).

Habitat and Biology: A benthic species found on sandy bottoms close to coral reefs. Occurs in small groups.

Size: Maximum size is 21 cm SL, commonly 17 cm SL.

Interest to Fisheries: No major fishery exists.

Local Names: SEYCHELLES: Ivano, Zaneau. MADAGASCAR: Tsy matahotra varatra, Ambity.

Literature: Smith & Smith (1963); Kuronuma & Abe (1972); Randall et al. (1978); Fischer & Bianchi (1984); Allen & Steene (1987).

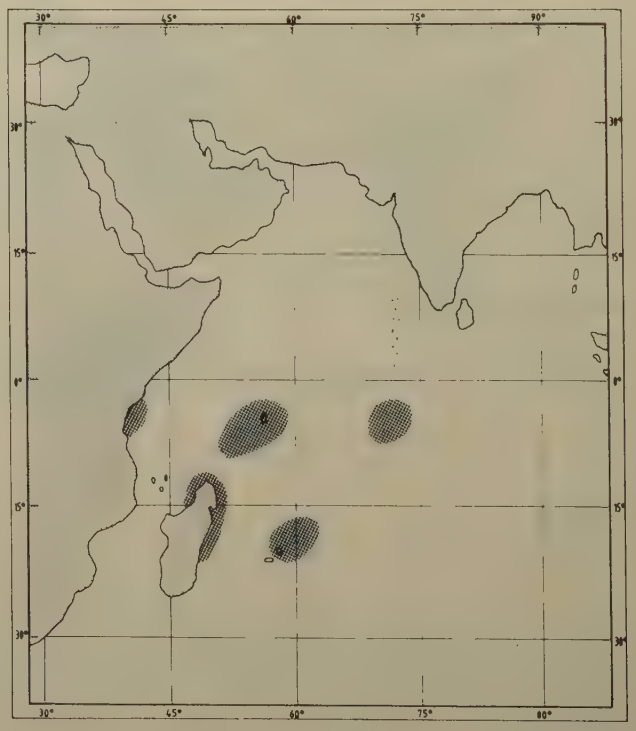


Fig. 204

Scolopsis ghanam (Forsskål, 1775) Fig. 205, Plate VII, e **NEMIP Scol 7**

Sciaena ghanam Forsskål, 1775, Descrip. Animal.: xii, 50 (Djedda and Lohaja, Red Sea).

Synonyms: ***Scolopsis ocularis***? Ehrenberg in Rüppell (1828-31 [1828]) (name in synonomy).

FAO Names: **En** - Arabian monocle bream. **Fr** - Mamila arabe. **Sp** - Besugato de Arabia.

Fig. 205

Diagnostic Features: Body depth 2.9 to 3.3 in SL; snout length less than diameter of eye; head scales reaching forward to level of middle of eyes; lower limb of preopercle naked; antrorse suborbital spine absent; suborbital depth 2.8 to 6.2 in eye; lateral-line scales 44 to 47 (usually 45 to 47); pectoral-fin rays ii, 13 to 16 (usually ii, 14); pelvic fins long, reaching to or just beyond level of anus; caudal fin forked. **Colour:** body silvery-grey with numerous black or dark brown spots on sides; spots above the lateral line forming 2 or 3 narrow brown or black stripes with white interspaces between; a pearly-white stripe from below eye to upper edge of pectoral base.

Geographical Distribution: Indian Ocean, including the Persian Gulf, Gulf of Oman, Red Sea, East African Coast to Delagoa Bay, Madagascar, and the Andaman Islands (Fig. 206).

Fig. 206

Habitat and Biology: A benthic species, found in inshore waters usually on shallow sandy bottoms close to coral reefs. Very abundant in the Persian Gulf. In the Zanzibar Channel, females with mature ova occur all year round, but most spawning appears to occur from September to January, with a recovery period from March to May (Nzoika, 1985a). Feeds on crustaceans, molluscs, echinoderms and fish.

Size: Maximum size is 15 cm SL, commonly 12 cm SL.

Interest to Fisheries: Taken by bottom trawls, handlines, traps and gill nets. Appears in small numbers in local markets. No major fishery exists.

Local Names: BAHRAIN: Zarra'a. SAUDI ARABIA: Abu m'sammer (Jeddah). KUWAIT: Ebzaimy. SOUTH AFRICA: Bleekband-stekelwang, palebanded spinecheek. MADAGASCAR: Ambity.

Literature: Randall et al. (1978); Fischer & Bianchi (1984); Bauchot & Bianchi (1984); Bianchi (1985a, 1985b); Al-Baharna (1986); Kuronuma & Abe (1986); Smith & Heemstra (1986); Allen & Steene (1987).

Scolopsis lineatus Quoy & Gaimard (1824) Fig. 207, Plate VII, f,g **NEMIP Scol 11**

Scolopsis lineatus Quoy & Gaimard, 1824, Voy. "Uranie," Zool.: 322, (Waigiu; Guebe Island).

Synonyms: ***Scolopsides cancellatus*** Cuvier in C. & V. (1830a).

FAO Names: En - Striped monocle bream. **Fr** - Scolopsis rayé.

Fig. 207

Diagnostic Features: Body depth 2.8 to 3.3 in SL; snout length less than diameter of eye; head scales reaching forward to or just in front of level of anterior margin of eye; lower limb of preopercle naked; antrorse suborbital spine absent; suborbital depth 2.8 to 4.9 in eye diameter;

lower limb of preopercle naked; lateral-line scales 40 to 46 (usually 42 or 43); pectoral-fin rays ii, 12 to 15 (usually ii, 14); pelvic fins long, reaching beyond level of anus; caudal fin forked. **Colour**: body olive brown above, silvery-white below; 3 yellowish-white stripes, the uppermost along the dorsal profile, the next from the eye to the end of the dorsal-fin base, the lower one midlaterally; with age the stripes becoming obscure posteriorly and interconnected in a lattice-like pattern with vertical whitish bars; fins white. Juveniles white, with 3 black bands on upper half of body, interspace between lower pair of bands yellow; black spot between first three dorsal spines (Plate VII, g).

Geographical Distribution: West Pacific from the Ryukyu Islands to the Marshall Islands and Vanuatu, and the southeastern Indian Ocean including the Cocos-Keeling Islands and northwestern Australia. Record from the Andaman Islands (Day, 1870) is unconfirmed (Fig. 208).

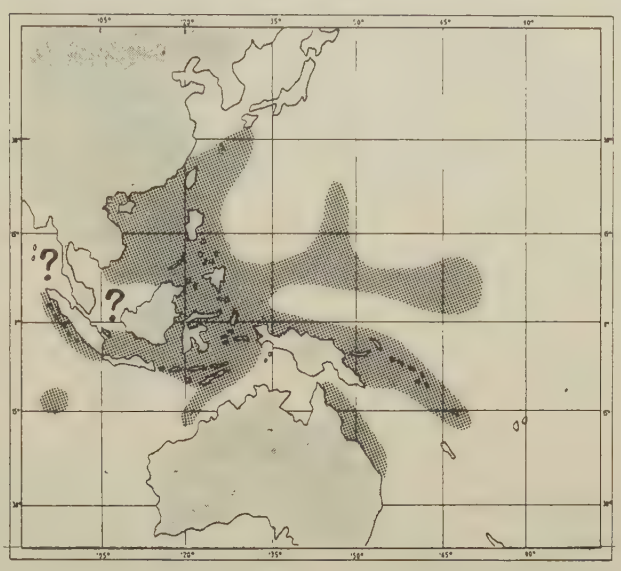


Fig. 208

Habitat and Biology: A benthic species, common on coral reefs usually associated with sandy areas, in depths to 20 m. Occurs in pairs or small groups. Feeds on small fishes and crustaceans.

Size: Maximum size is 18 cm SL, commonly 13 cm SL.

Interest to Fisheries: Appears occasionally in small numbers in local markets. No major fishery exists.

Local Names: PHILIPPINES: Silay (Cuyonin), Salingukod (Visayan), Buruba, Tagisang lawin (Tagalog). GUAM: Sihig, Black-and-white monocle bream. INDONESIA: Pasir-pasir. JAPAN: Yokosuji-tamagashira, Yokoshima-tamagashira. AUSTRALIA: Lined spine-cheek, Latticed monocle bream (Queensland).

Literature: The following refer to this species as ***S. cancellatus***: Masuda et al. (1975, 1984); Fourmanoir & Laboute (1976); Rau & Rau (1980); Schroeder (1980); Grant (1982); Amesbury & Myers (1982); Gloerfelt-Tarp & Kailola (1984); Shen (1984). Myers (1989) correctly uses the name ***S. lineatus***.

Remarks: This species has been referred to by most authors as ***S. cancellatus***, a junior synonym of ***S. lineatus***. Juveniles are very similarly coloured to juveniles of ***S. bilineatus***, but in ***S. lineatus*** the interspace between the top pair of lateral stripes is white.

Scolopsis margaritifer (Cuvier, 1830) | Fig. 209, Plate VII, h; VIII, a | **NEMIP Scol 12**

Scolopsides margaritifer Cuvier in C. & V., 1830a, Hist. nat. poiss., 5: 337 (Waigiou).

Synonyms: ***Scolopsides pectinatus*** Kuhl & Van Hasselt in C. & V. (1830a); ***Scolopsis leucotaenia*** Bleeker (1852a); ***Scolopsides leucotaenioides*** Bleeker (1855); ***Scolopsis macropthalmus*** Ramsay & Ogilby (1886).

FAO Names: En - Pearly monocle bream.

Fig. 209

Diagnostic Features: Body depth 2.4 to 3.8 in SL; snout length less than diameter of eye; head scales reaching to or almost to posterior nostrils; lower limb of preopercle scaly; antrorse suborbital spine absent; suborbital depth 2.3 to 7.0 in eye diameter; lateral-line scales 35 to 39 (usually 37 or 38); pectoral-fin rays ii, 14 or 15 (usually ii, 14); pelvic fins long, reaching almost to or beyond level of origin of anal fin; caudal fin forked. **Colour:** olive above, white below; centre of scales with pearly or yellowish spots, forming longitudinal and transverse lines; 2 pearly stripes on snout in front of eyes; fins yellowish; lower lobe of caudal fin reddish. Juveniles white, with a narrow black stripe along back (lacking in some specimens) and black midlateral stripe; some specimens with ventral half of body yellowish; a black spot between first four dorsal spines (Plate VIII, a).

Geographical Distribution: West Pacific from the South China Sea to Vanuatu, and north-western Australia (Fig. 210).

Fig. 210

Habitat and Biology: A benthic species found on sand bottoms close to reefs, in depths to 20 m. Usually solitary. Feeds on crustaceans, polychaete worms, molluscs and small fishes. Juveniles appear to be Batesian mimics of poison-fanged blenniids (*Meiacanthus*).

Size: Maximum size is 17.5 cm SL, commonly 15 cm SL.

Interest to Fisheries: Appears occasionally in small numbers in local markets. Caught incidentally by trawlers in the Gulf of Thailand. No major fishery exists.

Local Names: PHILIPPINES: Silay (Visayan), Katambak, Buruba, Tagisang lawin (Tagalog). INDONESIA: Sero malam, Pasir manuk (Java). AUSTRALIA: Pearly spine-cheek (Queensland). PAPUA NEW GUINEA: Degari (Port Moresby).

Literature: Masuda et al.(1975, 1984); Rau & Rau (1980); Schroeder (1980); Gloerfelt-Tarp & Kailola (1984); Myers (1989).

Scolopsis monogramma (Kuhl & Van Hasselt, 1830)

NEMIP Scol 13

Fig. 211, Plate VIII, b

Scolopsides monogramma Kuhl & Van Hasselt in C. & V., 1830a, Hist. nat. poiss., 5: 338 (Java, Batavia).

Synonyms: ***Scolopsis regina*** Whitley (1937).

FAO Names: En - Monogrammed monocle bream.

Fig. 211

Diagnostic Features: Body depth 2.5 to 3.0 in SL; snout length greater than diameter of eye; head scales reaching to between anterior margin of eyes and posterior nostrils; lower limb of preopercle scaly; antrorse suborbital spine absent; suborbital depth 1.2 to 2.1 in eye diameter; lateral-line scales 46 to 49 (usually 47 or 48); pectoral-fin rays ii, 15 to 17 (usually ii, 16); pelvic fins long, reaching almost to level of origin of anal fin; caudal fin forked or lunate, upper lobe a little longer than lower (lobes produced to form short filamentous extensions in larger specimens). **Colour:** greyish on back, white below; brown longitudinal steaks on back above lateral line, and oblique yellow streaks below lateral line; a brown midlateral stripe, expanded in the middle; 3 blue stripes on snout; uppermost joining eyes above nostrils, middle stripe joining eyes through nostrils, lower stripe from eye to tip of snout; interspaces between stripes yellow; a blue stripe on preopercle behind eye; a blue chevron-shaped stripe running upwards onto opercle from below eye and bending downwards towards pectoral-fin base; space between stripes on preopercle and opercle yellow; a brown bar at base of pectoral fin; unpaired fins pale yellow, edged with blue.

Geographical Distribution: West Pacific from the Ryukyu Islands to northeastern Australia, and Eastern Indian Ocean from the Andaman Sea to northwestern Australia (Fig. 212).

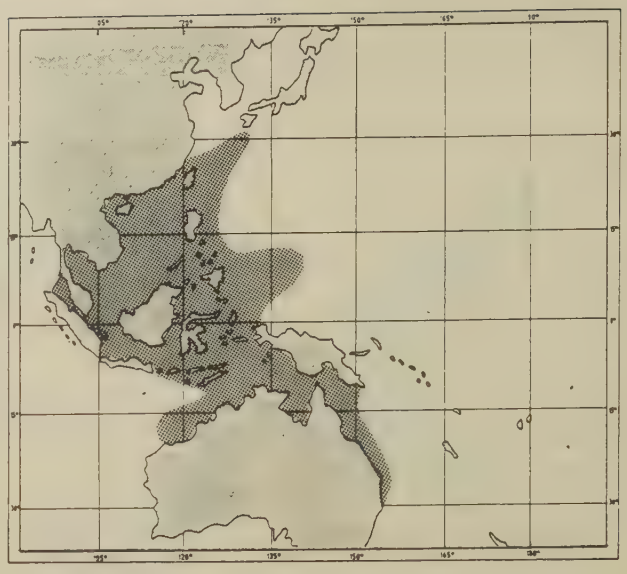


Fig. 212

Habitat and Biology: A benthic species found on sand bottoms close to reefs in depths to 50 m. Occurs solitary or in small groups. Feeds on small fishes, crustaceans, molluscs and polychaete worms. A protogynous hermaphrodite.

Size: Maximum size is 26 cm SL, com- monly 18 cm SL.

Interest to Fisheries: Appears in small numbers in local markets. Caught by trawl and bamboo stake trap (Thailand), and by handline. Sold fresh. Prepared fried and in fish balls or used as duck food (Thailand). No major fishery exists.

Local Names: PHILIPPINES: Butlog (Visayan), Siri (Tagalog), Silay, Magkotkot. INDONESIA: Pasir-pasir. MALAYSIA: Pasir-pasir. PAPUA-NEW GUINEA: Bai (Port Moresby). JAPAN: Hitosuji-tamagashira, Hime-tamagashira. THAILAND: Pla Sai Khao. AUSTRALIA: Barred-face spine-cheek, threadfin monocle bream, monocle-bream, rainbow bream (Queensland).

Literature: The following have reported this species as ***S. dubiosus***: Masuda et al. (1975, 1984); Rau & Rau (1980); Schroeder (1980); Shen (1984). Grant (1982) reports it as ***S. temporalis***. It is correctly named by Sainsbury et al. (1984); Gloerfelt-Tarp & Kailola (1984); and Allen & Swainston (1988).

Remarks: This species has been previously reported as ***S. dubiosus*** (= ***S. taeniopterus***), or misidentified as ***S. temporalis***.

Scolopsis taeniatus (Ehrenberg, 1830) | Fig. 213, Plate VIII, c | **NEMIP Scol 8**

Scolopsides taeniatus Ehrenberg in C. & V., 1830a, Hist nat. poiss., 5: 340 (no type locality given).

Synonyms: ***Scolopsis nototaenia*** Günther in Playfair & Günther (1866).

FAO Names: En - Black-streaked monocle bream.

Fig. 213

Diagnostic Features: Body depth 2.8 to 3.1 in SL; snout length about equal to or a little greater than diameter of eye; head scales reaching forward to or just in front of level of anterior margin of eyes; lower limb of preopercle scaly; antrorse suborbital spine absent; suborbital depth 1.3 to 3.8 in eye diameter; lateral-line scales 45 to 48 (usually 46 or 47); pectoral-fin rays ii, 15 or 16 (usually ii, 15); pelvic fins long, reaching to level of anus; caudal fin forked. **Colour**: greenish-olive above, whitish below; a narrow whitish stripe along base of dorsal fin; beneath this, a prominent dark brown or black streak above lateral line beginning below about the third or fourth dorsal spine and ending on caudal peduncle; a bright blue stripe from eye to upper jaw and from posterior edge of the eye to base of pectoral fin, where it ends in a blue spot; dorsal fin orange coloured anteriorly, reddish posteriorly, with a vivid red margin; other fins yellowish or reddish.

Geographical Distribution: Western Indian Ocean, including the Red Sea, Gulf of Aden, Gulf of Oman, Persian Gulf, Arabian Sea and Sri Lanka (Gulf of Mannar) (Fig. 214).

Habitat and Biology: A benthic species, commonly found associated with reefs. Abundant in the Persian Gulf.

Size: Maximum size is 28 cm SL, commonly 15 cm SL.

Interest to Fisheries: Appears occasionally in local markets. Taken by trawl in the Persian Gulf. No major fishery exists.

Local Names: BAHRAIN: Ebzaymee. KUWAIT: Ebzaimy.

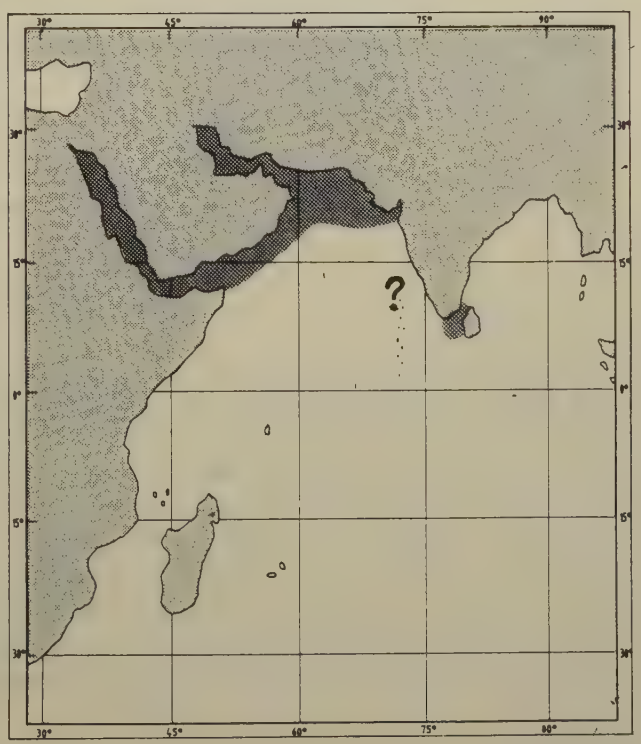


Fig. 214

Literature: Kuronuma & Abe (1972); Randall et al. (1978, as ***S. rueppelli***); Fischer & Bianchi (1984); Bianchi (1985b); Al-Baharna (1986).

Remarks: This species has been incorrectly identified by some authors as ***S. rupellii*** (= ***S. vosmeri***) or as ***S. phaeops*** (= ***S. frenatus***).

Scolopsis taeniopterus (Kuhl & Van Hasselt, 1830)

NEMIP Scol 1

Fig. 215, Plate VIII, d

Scolopsides taeniopterus Kuhl & Van Hasselt in C. & V., 1830a, Hist nat. poiss., 5: 345 (Java).

Synonyms: ***Scolopsis dubiosus*** Weber (1913); ***Scolopsis siamensis*** Akazaki (1962).

FAO Names: En - Lattice monocle bream.

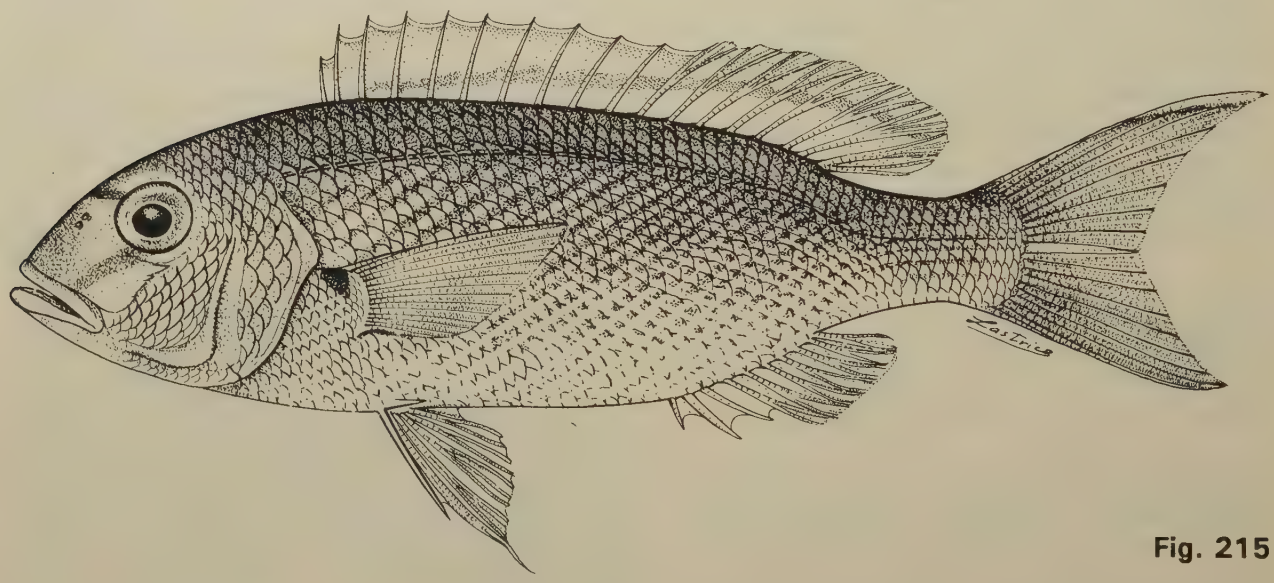


Fig. 215

Diagnostic Features: Body depth 2.7 to 3.1 in SL; snout length about equal to diameter of eye; head scales reaching forward to between level of anterior margin of eyes and posterior nostrils; lower limb of preopercle naked; antrorse suborbital spine absent; suborbital depth 1.1 to 3.5 in eye diameter; lateral-line scales 45 to 48; pectoral-fin rays ii, 15 or 16 (usually ii, 15); pelvic fins long, reaching to or beyond level of anus; caudal fin emarginate. **Colour:** greyish-yellow on upper part of body, whitish below; sides of body with faint oblique blue and yellow lines, these horizontal on the caudal peduncle; a narrow blue stripe joining eyes just behind nostrils; a blue stripe from middle of upper lip to lower edge of eye; upper part of pectoral-fin base with a reddish-orange spot; fins yellowish; dorsal fin with a blue stripe along its middle area; upper tip of caudal fin bright yellow; upper base of caudal fin with a blue spot.

Geographical Distribution: West Pacific, from Taiwan to northeastern Australia, and northwestern Australia (Fig. 216).

Fig. 216

Habitat and Biology: A benthic species, found on sand or mud bottoms in offshore areas, in depths to 50 m. Swims in small groups. Feeds on small crustaceans, molluscs and fishes. A protogynous hermaphrodite.

Size: Maximum size is 20 cm SL, commonly 15 cm SL.

Interest to Fisheries: This is the most abundant species of ***Scolopsis*** seen in markets in Singapore, Malaysia and Thailand. Trawled in moderate numbers along with other species in the South China Sea and Gulf of Thailand. Highly rated as a food fish, although it sells for a low price. Sold fresh. It is prepared steamed or used for fish balls; sometimes salted or dried. No separate statistics for this species are kept and no major fishery exists.

Local Names: PHILIPPINES: Silay (Visayan), Buruba, Tagisang lawin. INDONESIA: Pasir-pasir. MALAYSIA: Pasir-pasir, Mempasir. THAILAND: Pla Sai Khao. AUSTRALIA: Red-spot monocle-bream.

Literature: Fischer & Whitehead (1974); Rau & Rau (1980); Schroeder (1980, as ***S. temporalis***); Kyushin et al. (1982); Sainsbury et al. (1984); Gloerfelt-Tarp & Kailola (1984); Allen & Swainston (1988).

Remarks: This species has been misidentified as ***S. cancellatus*** (= ***S. lineatus***). Some authors have also treated it under the name ***S. dubiosus***, which is a junior synonym.

Scolopsis temporalis (Cuvier, 1830) | Fig. 217, Plate VIII, e | **NEMIP Scol 14**

Scolopsides temporalis Cuvier in C. & V., 1830a, Hist. nat. poiss., 5: 341 (Waigiu, New Guinea; Vanikolo).

Synonyms: None.

FAO Names: En - Bald-spot monocle bream.

Fig. 217

Diagnostic Features: Body depth 2.7 to 3.1 in SL; snout length greater than diameter of eye; head scales reaching forward to or just behind level of anterior margin of eye; a small naked area on temporal region behind eye; lower limb of preopercle scaly; antrorse suborbital spine absent; suborbital depth 1.2 to 1.9 in eye diameter; lateral-line scales 46 to 49 (usually 47 or 48); pectoral-fin rays ii, 16 or 17 (usually ii, 16); pelvic fins long, reaching to or beyond level of anus; caudal fin forked, lobes falcate, upper lobe a little longer than lower (lobes produced to form filamentous extensions in larger specimens). **Colour:** bluish on back and sides, ventral surface white; scales above lateral line with yellow centres, forming horizontal lines on back; scales below lateral line also with yellow centres, forming oblique lines running upwards to lateral line; a pinkish-brown stripe from behind eye, arching on back beneath lateral line and terminating behind tip of pectoral fin; four blue stripes on head; the first, uppermost stripe joining in front of the scaled part of the head; the second stripe joining the eyes above the nostrils; the third stripe joining the eyes through the nostrils; the fourth stripe running from the eye to middle of upper legs; the naked temporal area on the head encircled blue; inner part of pectoral fin yellowish; dorsal fin yellowish with darker mottling; caudal fin yellowish; its upper edge and lower one third brownish.

Geographical Distribution: Eastern Indonesia, Solomon Islands, Santa Cruz Islands, Fiji (Fig. 218).

Habitat and Biology: A benthic species found on sand bottoms close to reefs in depths to 30 m.

Size: Maximum size is 28 cm SL, commonly 20 cm SL.

Interest to Fisheries: No major fishery exists.

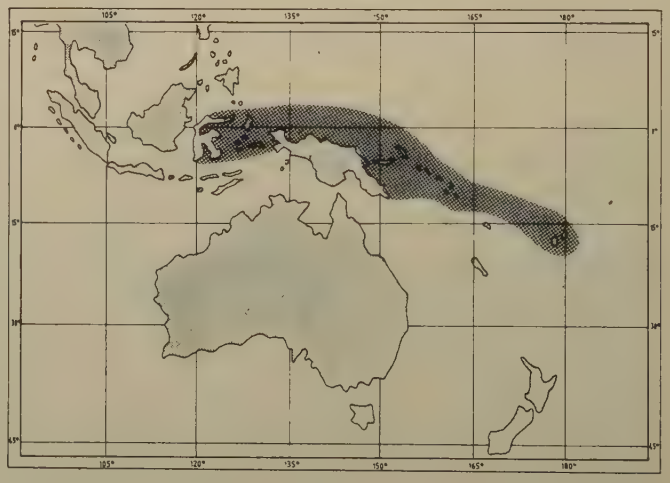


Fig. 218

Literature: Weber & de Beaufort (1936).

Remarks: This species closely resembles ***S. monogramma***, and the two species have been previously confused.

Scolopsis trilineatus Kner, 1868 | Fig. 219, Plate VIII, f | NEMIP Scol 15

Scolopsis trilineatus Kner, 1868, Sitzber. Akad. Wien, 58: 27 (Savay, Samoa).

Synonyms: None.

FAO Names: En - Three-lined monocle bream. **Fr** - Scolopsis a trois lignes.

Fig. 219

Diagnostic Features: Body depth 3.0 to 3.6 in SL; snout length about equal to diameter of eye; head scales reaching forward to level of middle of eyes; lower limb of preopercle naked; antrorse suborbital spine absent; suborbital depth 2.5 to 5.0 in eye diameter; lateral-line scales 41 to 44; pectoral-fin rays ii, 13 or 14 (usually ii, 14); pelvic fins long, reaching to or just beyond level of anus; caudal fin forked. **Colour:** dusky grey or brown on back, silvery-white below; scales on sides with pearly-blue centres; a bluish-white line middorsally from top of snout to dorsal fin origin; a second line above eye; a third line from upper edge of eye, convexly arching on nape and following dorsal profile to beneath middle of dorsal fin; a broader bluish-white stripe from behind eye, curving convexly upwards on back and terminating at end of dorsal fin, this stripe narrower above lateral line; a narrow yellowish line from beneath eye curving upwards and joining broader stripe on body at lateral line; snout and top of head brownish; three bluish-white stripes on snout; the uppermost joining eyes above nostrils; the middle stripe joining eyes through nostrils; the lower stripe from tip of snout to eye.

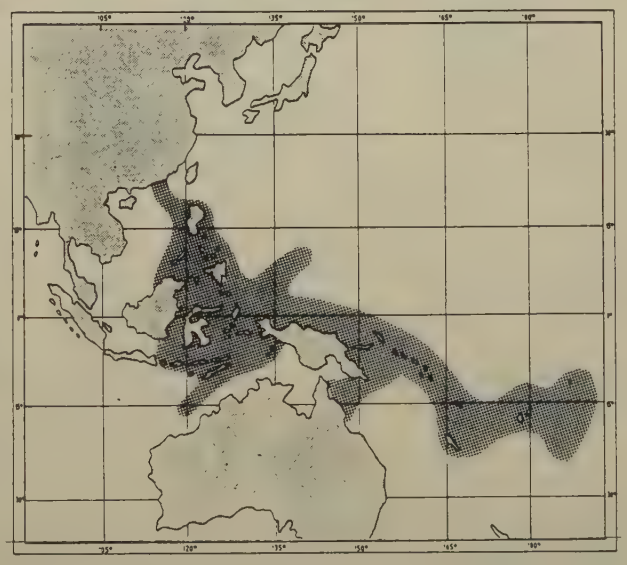


Fig. 220

Geographical Distribution: Western Pacific, including the Philippines, western Caroline Islands, South China Sea, eastern Indonesia, northern Australia, New Guinea, New Caledonia, Fiji, Samoa, Tonga, and northwestern Australia (Fig. 220).

Habitat and Biology: A benthic species, found on sand bottoms in lagoons and close to reefs, in depths to 20 m. Occurs solitary or in small aggregations.

Size: Maximum size is 16.5 cm SL, commonly 14 cm SL.

Interest to Fisheries: Appears occasionally in small numbers in local markets. No major fishery exists.

Local Names: INDONESIA: Pasir-pasir. PAPUA NEW GUINEA: Wonano (Port Moresby). SAMOA: Tivao.

Literature: Fourmanoir & Laboute (1976); Gloerfelt-Tarp & Kailola (1984); Myers (1989).

Scolopsis vosmeri (Bloch, 1792)	Fig. 221, Plate VIII, g	**NEMIP Scol 2**

Anthias vosmeri Bloch, 1792, Naturges. Ausländ. Fische, 6: 120, pl. 321 (Japan Sea).

Synonyms: ***Anthias japonicus*** Bloch (1793); ***Pomacentrus enneodactylus*** Lacépède (1802); ***Scolopsis kurite*** Rüppell (1828-31 [1828]); ***Scolopsides kate*** Cuvier in C. & V. (1830a); ***Scolopsides rupellii*** Cuvier in C. & V. (1830a); ***Scolopsis argyrosomus*** Kuhl & Van Hasselt in C. & V. (1830a) (name in synonymy); ***Scolopsides torquatus*** Cuvier in C. & V. (1830a); ***Scolopsides pomotis*** Richardson (1846); ***Scolopsides collaris*** Günther (1859) (name in text).

FAO Names: En - Whitecheek monocle bream. **Fr** - Mamila joues blanches. **Sp** - Besugato cariblanco.

Fig. 221

Diagnostic Features: Body depth 2.0 to 2.6 in SL; snout length a little less than diameter of eye; head scales reaching to anterior nostrils; lower limb of preopercle scaly; antrorse suborbital spine present beneath eye; suborbital depth 1.7 to 3.8 in eye diameter; lateral-line

scales 39 to 45 (usually 41 to 44); pectoral-fin rays ii, 15 to 17 (usually ii, 16); pelvic fins long, reaching to or just beyond level of anus; caudal fin forked. **Colour**: variable, usually brownish with a reddish-purple tinge; a broad white vertical bar from top of head onto opercle; sometimes a whitish horizontal stripe below lateral line from edge of opercle to below soft part of dorsal fin; scales on sides with dark spots; opercular membrane blood-red; fins greyish, tinged red.

Geographical Distribution: Indo-West Pacific, from the east African coast, Red Sea and Persian Gulf to northern Australia (Fig. 222).

Fig. 222

Habitat and Biology: A benthic species, found in inshore waters usually on sand or mud bottoms close to reefs, as well as in offshore areas.

Size: Maximum size is 16 cm SL, commonly 15 cm SL.

Interest to Fisheries: Taken by bottom trawls, handlines and traps. Caught in wire traps and trawls (Thailand). Appears occasionally in small numbers in local markets.

In Thailand this species is steamed or made into fish balls. No major fishery exists.

Local Names: AUSTRALIA: White-cheeked monocle-bream. INDONESIA: Pasir-pasir. MALAYSIA: Pasir-pasir, kerisi, puyu laut. PHILIPPINES: Silay (Visayan), Buruba, Tagisang lawin. JAPAN: Taiwan-tamagashira. BAHRAIN: Hasseyeh. SRI LANKA: Andiya Kiri vavoula (Sinhalese), Andiyan (Tamil). THAILAND: Pla Krang, Pla Sai khao. SOUTH AFRICA: Silwerflitsstekelwang, Silver flash spinecheek. MADAGASCAR: Ambity. TANZANIA: Gege-muamba (Dar-es-Salaam), Changu-chole (Mafia). PAKISTAN: Pandya (Sindhi), Shahar Bano (Baluchi). VIETNAM: Ca trao.

Literature: Fisher & Whitehead (1974); Randall et al. (1978); Tan et al. (1982); Rau & Rau (1980); Fischer & Bianchi (1984); Sainsbury et al. (1984); Gloerfelt-Tarp & Kailola (1984); Bauchot & Bianchi (1984); Shen (1984); Bianchi (1985a, 1985b); Al-Baharna (1986); Kuronuma & Abe (1986); Smith & Heemstra (1986); Allen & Steene (1987); Allen & Swainston (1988).

Scolopsis xenochrous Günther, 1872 | Fig. 223, Plate VIII, h | **NEMIP Scol 16**

Scolopsis xenochrous Günther, 1872, Ann. Mag. Nat. Hist., (4) 10: 423 (Misola, Moluccas).

Synonyms: ***Scolopsis bulanensis*** Evermann & Seale (1907).

FAO Names: En - Oblique-barred monocle bream.

Fig. 223

Diagnostic Features: Body depth 3.2 to 3.4 in SL; snout length a little less than diameter of eye; head scales reaching forward to between level of anterior margin of eyes and posterior nostrils; lower limb of preopercle scaly; antrorse suborbital spine present beneath eye; suborbital depth 2.7 to 3.5 in eye diameter; lateral-line scales 42 to 45 (usually 43 to 45); pectoral-fin rays ii, 15; pelvic fins moderately long, reaching to or almost to level of anus; caudal fin forked. **Colour:** greyish-brown above, silvery-white below; a pearly-blue streak from behind eye along dorsal fin base; an oblique, brown-edged pearly-blue bar above the pectoral base; several short oblique rows of dusky brown spots on the sides; an elongate white blotch below lateral line on posterior half of body, a yellowish tinge above this blotch; snout dusky; a black blotch on opercle; fins bluish-tinged.

Geographical Distribution: Indian Ocean, including the Maldives, Sri Lanka, Andaman Sea and northwestern Australia. West Pacific, including Taiwan, the Philippines, Indonesia, New Guinea, northeastern Australia, and the Solomon Islands (Fig. 224).

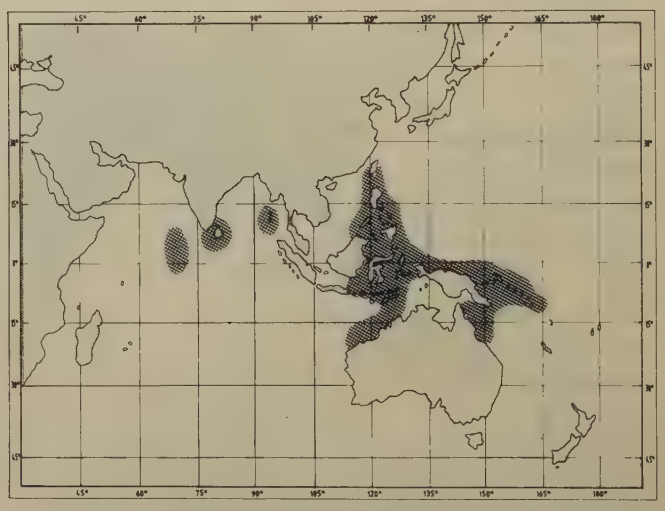


Fig. 224

Habitat and Biology: A benthic species found around rocky-rubble and seaweed areas as well as coral reefs, in depths of 5 to 50 m. Feeds mainly on benthic crustaceans.

Size: Maximum size is 17 cm SL, commonly 14 cm SL.

Interest to Fisheries: Appears occasionally in small numbers in local markets. No major fishery exists.

Local Names: PHILIPPINES: Silay (Visayan).

Literature: Schroeder (1980); Allen & Swainston (1988).

3. LIST OF NOMINAL SPECIES OF NEMIPTERIDAE

The following list gives in order (i) the scientific name as it originally appeared, in alphabetical order according to the specific name; (ii) the author(s) - Cuvier = in Cuvier & Valenciennes; De Vis (1918) = in Ogilby (1918); Ehrenberg (1828) = in Rüppell; Ehrenberg (1830a, 1830b) = in Cuvier & Valenciennes; Günther (1866) = in Playfair & Günther; Kuhl & Van Hasselt = in Cuvier & Valenciennes; Richardson (1946b) = in Stokes; Schlegel = in Temminck & Schlegel; Schneider = in Bloch & Schneider; Valenciennes = in Cuvier & Valenciennes; (iii) date of publication; and (iv) present identification. A question mark (?) preceding the present species name indicates that identification is provisional.

Nominal Species	Present Identification
Scolopsis affinis Peters, 1877	*Scolopsis affinis*
Lycogenis argyrosoma Kuhl & Van Hasselt, 1830a	*Scolopsis ciliatus*
Scolopsis argyrosomus Kuhl & Van Hasselt, 1830a	*Scolopsis vosmeri*
Scolopsis aspinosa Rao & Rao, 1981	*Parascolopsis aspinosa*
Perca aurata Park, 1797	*Scolopsis auratus*
Lutjanus aureovittatus Lacépède, 1802	*Scolopsis auratus*
Pentapus aurifilum Ogilby, 1910	*Nemipterus aurifilum*
Maenoides? auro-frenatus Richardson, 1843	*Pentapodus porosus*
Dentex balinensis Bleeker, 1858-9	*Nemipterus balinensis*
Synagris balinensoides Popta, 1918	*Nemipterus balinensoides*
Nemipterus bathybius Snyder, 1911	*Nemipterus bathybius*
Heterognathodon bifasciatus Bleeker, 1848	*Pentapodus bifasciatus*
Anthias bilineatus Bloch, 1793	*Scolopsis bilineatus*
Scolopsis bimaculatus Rüppell, 1828-31 (1828)	*Scolopsis bimaculatus*
Dentex bipunctatus Ehrenberg, 1830b	*Nemipterus bipunctatus*
Scolopsis bleekeri Günther, 1859	*Scolopsis bilineatus*
Synagris Bleekeri Day, 1875	*Nemipterus bipunctatus*
Dentex Blochii Bleeker, 1851c	*Nemipterus japonicus*
Scolopsis boesemani Rao & Rao, 1981	*Parascolopsis boesemani*
Scolopsis bulanensis Evermann & Seale, 1907	*Scolopsis xenochrous*
Scolopsides burukuarem Thiollière, 1857	nomen dubium
Scolopsides cancellatus Cuvier, 1830a	*Scolopsis lineatus*
Scolopsides caninus Cuvier, 1830a	*Pentapodus caninus*
Dentex celebicus Bleeker, 1854	*Nemipterus celebicus*
Holocentrus ciliatus Lacépède, 1802	*Scolopsis ciliatus*
Scolopsides collaris Günther, 1859	*Scolopsis vosmeri*
Maenoides? cyano-taeniatus Richardson, 1843b	*Scaevius milii*
Bodianus decacanthus Lacépède, 1802	*Pentapodus trivittatus*
Nemipterus delagoae Smith, 1941	*Nemipterus bipunctatus*
Heterognathodon doederleini Ishikawa, 1904	*Parascolopsis inermis*
Scolopsis dubiosus Weber, 1913	*Scolopsis taeniopterus*
Lutjanus ellipticus Lacépède, 1802	*Scolopsis bilineatus*
Scolopsis elongatus Weber, 1913	*Pentapodus trivittatus*
Mesoprion?? Emeryii Richardson, 1843	*Pentapodus emeryii*
Pomacentrus enneodactylus Lacépède, 1802	*Scolopsis vosmeri*
Scolopsis eriomma Jordan & Richardson, 1909	*Parascolopsis eriomma*
Cantharus filamentosus Rüppell, 1828	*Nemipterus japonicus*
Dentex filamentosus Valenciennes, 1830b	*Nemipterus nematophorus*
Dentex filifer Castelnau, 1875	*Pentapodus paradiseus*
Dentex filiformis Seale, 1909	*Pentapodus setosus*
Bodianus Fischerii Lacépède, 1802	? *Pentapodus trivittatus*

Heterognathodon flaviventris Steindachner, 1866	*Nemipterus japonicus*
Synagris flavolinea Fowler, 1931a	*Nemipterus japonicus*
Pentapus formulosus Snyder, 1911	*Pentapodus caninus*
Perca frenata Günther, 1859	*Scolopsis bilineatus*
Scolopsides frenatus Cuvier, 1830a	*Scolopsis frenatus*
Dentex furcosus Valenciennes, 1830b	*Nemipterus furcosus*
Sciaena ghanam Forsskål, 1775	*Scolopsis ghanam*
Dentex gracilis Bleeker, 1873	*Nemipterus gracilis*
Synagris grammicus Day, 1865	*Nemipterus japonicus*
Cantharus guliminda Valenciennes, 1830b	*Nemipterus peronii*
Nemipterus guntheri Ogilby, 1918	*Nemipterus furcosus*
Heterognathodon Hellmuthii Bleeker, 1853c	*Pentapodus caninus*
Dentex hexodon Quoy & Gaimard, 1824	*Nemipterus hexodon*
Dentex hypselognathus Bleeker, 1873	*Nemipterus furcosus*
Scolopsides inermis Schlegel, 1843	*Parascolopsis inermis*
Labrus? iris Richardson, 1843a	*Pentapodus paradiseus*
Pentapus iris Valenciennes, 1830b	*Pentapodus vitta*
Dentex isacanthus Bleeker, 1873	*Nemipterus isacanthus*
Anthias japonicus Bloch, 1793	*Scolopsis vosmeri*
Sparus japonicus Bloch, 1791	*Nemipterus japonicus*
Parascolopsis jonesi Talwar, 1986	*Parascolopsis aspinosa*
Scolopsides kate Cuvier, 1830a	*Scolopsis vosmeri*
Scolopsis kurite Rüppell, 1828	*Scolopsis vosmeri*
Scolopsides lerol Thiollière, 1857	nomen dubium
Scolopsis leucotaenia Bleeker, 1852a	*Scolopsis margaritifer*
Scolopsides leucotaenioides Bleeker, 1873	*Scolopsi margaritifer*
Scolopsis lineatus Quoy & Gaimard, 1824	*Scolopsis lineatus*
Pentapodus lineoscapularis Fowler, 1943	*Pentapodus bifasciatus*
Scolopsis longulus Richardson, 1842	*Scaevius milii*
Coryphaena lutea Schneider, 1801	? *Nemipterus japonicus*
Scolopsis luzonia Jordan & Seale, 1907	*Scolopsis ciliatus*
Scolopsides lycogenis Cuvier, 1830a	*Scolopsis ciliatus*
Scolopsis macropthalmus Ramsay & Ogilby, 1882	*Scolopsis margaritifer*
Synagris macronemus Günther, 1859	*Nemipterus nematophorus*
Heterognathodon macrurus Bleeker, 1851a	*Pentapodus caninus*
Scolopsides margaritifer Cuvier, 1830a	*Scolopsis margaritifer*
Dentex marginatus Valenciennes, 1830b	*Nemipterus marginatus*
Nemipterus matsubarae Jordan & Evermann, 1902	*Nemipterus virgatus*
Dentex mesoprion Bleeker, 1853a	*Nemipterus mesoprion*
Dentex metopias Bleeker, 1857	*Nemipterus zysron*
Heterognathodon microdon Bleeker, 1853b	*Pentapodus caninus*
Cantharus Milii Bory de Saint-Vincent, 1823	*Scaevius milii*
Scolopsides monogramma Kuhl & Van Hasselt, 1830a	*Scolopsis monogramma*
Dentex mulloides Bleeker, 1852b	*Nemipterus peronii*
Nemipterus mulloides Smith, 1939	*Nemipterus bipunctatus*
Leptoscolopsis nagasakiensis Tanaka, 1915	*Pentapodus nagasakiensis*
Dentex nematophorus Bleeker, 1853d	*Nemipterus nematophorus*
Dentex nematopus Bleeker, 1851b	*Nemipterus nematopus*
Dentex nemurus Bleeker, 1857	*Nemipterus nemurus*
Heterognathodon nemurus Bleeker, 1852d	*Pentapodus emeryii*
Scaevius nicanor Whitley, 1947	*Scaevius milii*
Dentex (Synagris) notatus Day, 1870	*Nemipterus hexodon*
Scolopsis nototaenia Günther, 1866	*Scolopsis taeniatus*
Dentex obtusus Bleeker, 1860	nomen nudum
Scolopsis ocularis? Ehrenberg, 1828	*Scolopsis ghanam*
Dentex Ovenii Bleeker, 1854	*Nemipterus furcosus*
Nemipterus oveniides Popta, 1921	*Nemipterus peronii*
Pentapus paradiseus Günther, 1859	*Pentapodus paradiseus*

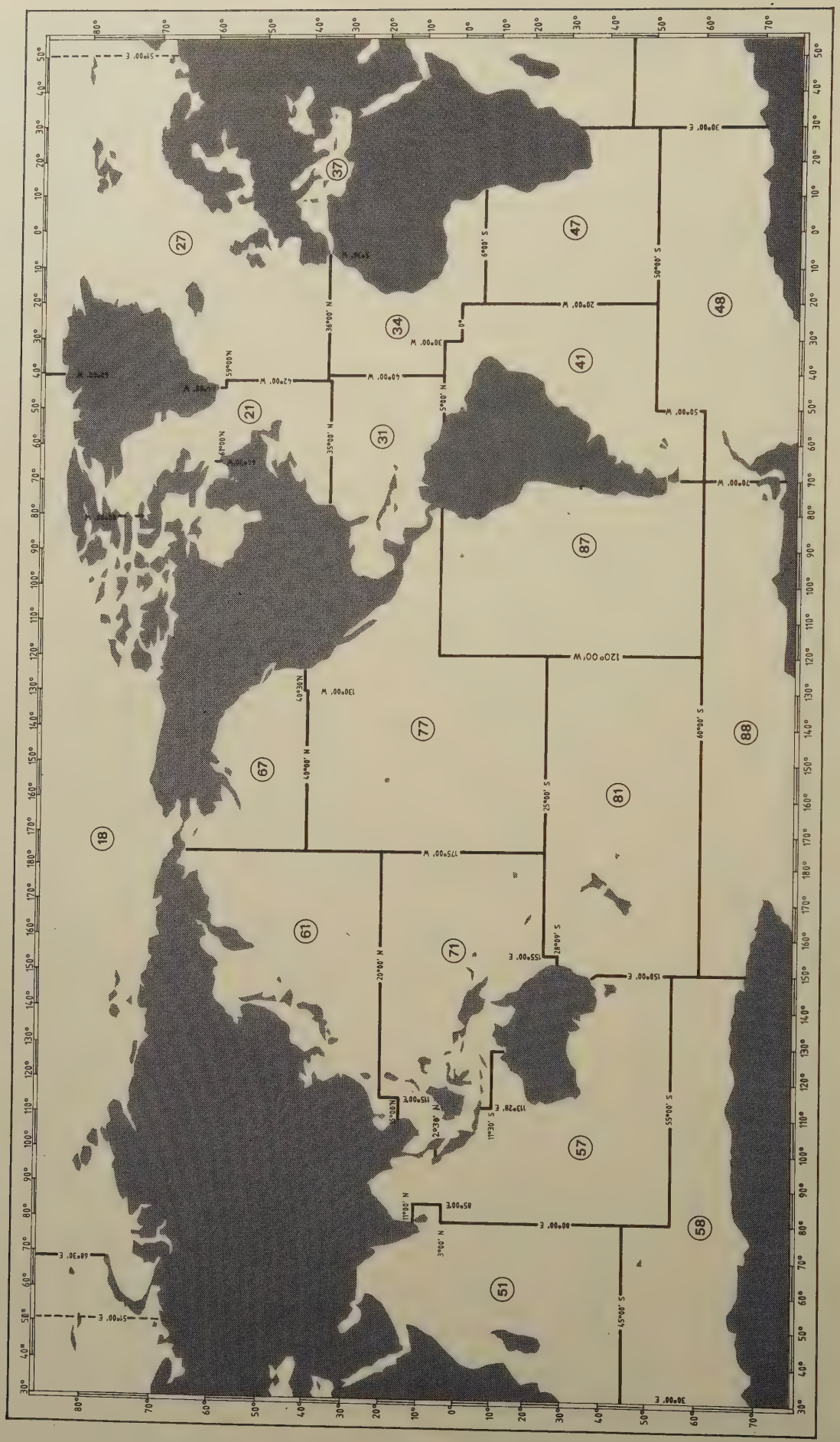
Scolopsides pectinatus Kuhl & Van Hasselt, 1830a		*Scolopsis margaritifer*
Nemipterus pentalinea Wongratana, 1974		nomen nudum
Dentex Peronii Valenciennes, 1830b		*Nemipterus peronii*
Pentapus Peronii Valenciennes, 1830b		*Pentapodus vitta*
Scolopsides personatus Cuvier, 1830a		*Scolopsis auratus*
Heterognathodon Petersii Steindachner, 1864		*Nemipterus zysron*
Scolopsides phaeops Bennett, 1831		*Scolopsis frenatus*
Scolopsis plebaeius De Vis, 1884		nomen dubium
Pentapus pleurostictus Duncker & Mohr, 1913		*Pentapodus trivittatus*
Scolopsides pomotis Richardson, 1846		*Scolopsis vosmeri*
Pentapus porosus Valenciennes, 1830b		*Pentapodus porosus*
Smaris porosus Richardson, 1846b		*Pentapodus vitta*
Parascolopsis qantasi Russell & Gloerfelt-Tarp, 1984		*Parascolopsis qantasi*
Nemipterus randalli Russell, 1986a		*Nemipterus randalli*
Scolopsis regina Whitley, 1937		*Scolopsis monogramma*
Nemipterus robustus Ogilby, 1916		*Nemipterus furcosus*
Dentex ruber Valenciennes, 1830b		*Nemipterus hexodon*
Genyorage rubicauda Saville-Kent, 1893		nomen nudum
Lutianus rubicundus De Vis, 1918		nomen nudum
Parascolopsis rufomaculatus Russell, 1986b		*Parascolopsis rufomaculatus*
Scolopsides rupellii Cuvier, 1830a		*Scolopsis vosmeri*
Nemipterus sampsonensis Scott, 1959		*Nemipterus peronii*
Dentex setigerus Valenciennes, 1830b		*Nemipterus virgatus*
Pentapus setosus Valenciennes, 1830b		*Pentapodus setosus*
Scolopsis siamensis Akazaki, 1962		*Scolopsis taeniopterus*
Sparus sinensis Lacépède, 1802		*Nemipterus virgatus*
Dentex (*Heterognathodon*) *Smithii* Steindachner, 1868		*Nemipterus peronii*
Scolopsis specularis De Vis, 1882	?	*Scolopsis ciliatus*
Dentex striatus Valenciennes, 1830b	?	*Nemipterus japonicus*
Dentex sumbawensis Bleeker, 1859		*Nemipterus nematopus*
Dentex sundanensis Bleeker, 1873		*Nemipterus furcosus*
Scolopsides taeniatus Ehrenberg, 1830a		*Scolopsis taeniatus*
Scolopsides taeniopterus Kuhl & Van Hasselt, 1830a		*Scolopsis taeniopterus*
Dentex taeniopterus Valenciennes, 1830b		*Nemipterus hexodon*
Dentex tambuloides Bleeker, 1853b		*Nemipterus tambuloides*
Dentex tambulus Valenciennes, 1830b		*Nemipterus japonicus*
Parascolopsis tanyactis Russell, 1986b		*Parascolopsis tanyactis*
Scolopsides temporalis Cuvier, 1830a		*Scolopsis temporalis*
Nemipterus theodorei Ogilby, 1916		*Nemipterus theodorei*
Dentex tolu Valenciennes, 1830b		*Nemipterus peronii*
Scolopsides torquatus Cuvier, 1830a		*Scolopsis vosmeri*
Scolopsis tosensis Kamohara, 1938		*Parascolopsis tosensis*
Parascolopsis Townsendi Boulenger, 1901		*Parascolopsis townsendi*
Scolopsis trilineatus Kner, 1868		*Scolopsis trilineatus*
Labrus trivittatus Bloch, 1791		*Pentapodus trivittatus*
Pentapus unicolour Valenciennes, 1830	?	*Pentapodus trivittatus*
Dentex upeneoides Bleeker, 1852c		*Nemipterus furcosus*
Latilus upeneoides Bleeker, 1845		nomen nudum
Sparus virgatus Houttuyn, 1782		*Nemipterus virgatus*
Nemipterus vitiensis Russell, 1990		*Nemipterus vitiensis*
Pentapodus vitta Quoy & Gaimard, 1824		*Pentapodus vitta*
Sparus vittatus Bloch, 1791		*Pentapodus trivittatus*
Anthias vosmeri Bloch, 1792		*Scolopsis vosmeri*
Nemipterus worcesteri Evermann & Seale, 1907		*Nemipterus furcosus*
Heterognathodon xanthopleura Bleeker, 1851a		*Pentapodus trivittatus*
Scolopsis xenochrous Günther, 1872		*Scolopsis xenochrous*
Heterodon zonatus Bleeker, 1845		nomen nudum
Dentex zysron Bleeker, 1856-57		*Nemipterus zysron*

4. LIST OF SPECIES BY MAJOR FISHING AREAS

SPECIES	PAGE	GEOGRAPHICAL DISTRIBUTION					
		MAJOR MARINE FISHING AREAS FOR STATISTICAL PURPOSES					
		51	57	61	71	77	81
Nemipterus aurifilum	26				●		●
Nemipterus balinensis	27		●	●			
Nemipterus balinensoides	28		●		●		
Nemipterus bathybius	30		●	●	●		
Nemipterus bipunctatus	31	●	●				
Nemipterus celebicus	33		●	●			
Nemipterus furcosus	34	●	●	●	●		●
Nemipterus gracilis	36		●	●			
Nemipterus hexodon	37		●	●	●		●
Nemipterus isacanthus	38		●		●		
Nemipterus japonicus	40	●	●	●	●		
Nemipterus marginatus	42		●		●		
Nemipterus mesoprion	43		●		●		
Nemipterus nematophorus	45		●	●	●		
Nemipterus nematopus	46				●		
Nemipterus nemurus	48				●		
Nemipterus peronii	49	●	●	●	●		
Nemipterus randalli	50	●					
Nemipterus sp. 1	52		●		●		
Nemipterus sp. 2	53			●	●		
Nemipterus sp. 3	55			●	●		
Nemipterus tambuloides	56		●		●		
Nemipterus theodorei	58				●		●
Nemipterus virgatus	59		●	●	●		
Nemipterus viteinsis	61				●	●	
Nemipterus zysron	62	●	●	●	●	●	
Parascolopsis aspinosa	67	●	●				
Parascolopsis boesemani	68		●				
Parascolopsis eriomma	69	●	●	●	●		
Parascolopsis inermis	71	●	●	●	●		
Parascolopsis qantasi	72		●				

SPECIES	PAGE	GEOGRAPHICAL DISTRIBUTION					
		MAJOR MARINE FISHING AREAS FOR STATISTICAL PURPOSES					
		51	57	61	71	77	81
Parascolopsis rufomaculatus	73		●				
Parascolopsis tanyactis	74		●		●		
Parascolopsis tosensis	75		●	●	●		
Parascolopsis townsendi	77	●					
Pentapodus bifasciatus	82				●		
Pentapodus caninus	83			●	●		
Pentapodus emeryii	84		●		●		
Pentapodus nagasakiensis	86		●	●	●		
Pentapodus paradiseus	87				●		
Pentapodus porosus	88		●		●		
Pentapodus setosus	89				●		
Pentapodus sp.	91				●	●	
Pentapodus trivittatus	92				●		
Pentapodus vitta	93		●				
Scaevius milii	95		●		●		
Scolopsis affinis	103		●	●	●		
Scolopsis auratus	104	●	●		●		
Scolopsis bilineatus	105	●	●	●	●	●	●
Scolopsis bimaculatus	107	●	●				
Scolopsis ciliatus	108		●		●		
Scolopsis frenatus	109	●					
Scolopsis ghanam	111	●	●				
Scolopsis lineatus	112		●		●		
Scolopsis margaritifer	113		●	●	●		
Scolopsis monogramma	115		●	●	●		
Scolopsis taeniatus	116	●					
Scolopsis taeniopterus	118		●	●	●		
Scolopsis temporalis	119				●	●	
Scolopsis trilineatus	121		●	●	●	●	
Scolopsis vosmeri	122	●	●	●	●		
Scolopsis xenochrous	123	●	●	●	●		

MAJOR MARINE FISHING AREAS FOR STATISTICAL PURPOSES



5. BIBLIOGRAPHY

Akazaki, M., 1959. Comparative morphology of pentapodid fishes. Zool. Mag., Tokyo, 68 (10): 373-374.

Akazaki, M., 1962. Studies on spariform fishes. Anatomy, phylogeny, ecology and taxonomy. Misaki Mar. Biol. Inst. Kyoto Univ. Spec. Rpt, 1-327 + 328-368 + 58.

Al-Baharna, W.S., 1986. Fishes of Bahrain. Ministry of Commerce and Agriculture, Directorate of Fisheries, Bahrain. 294 p.

Allen, G.R. et al., 1975. Mimicry in marine fishes. Trop. Fish Hobby., September, 1975: 47-56.

Allen, G.R. & R.C. Steene, 1987. Reef fishes of the Indian Ocean. A pictorial guide to the common reef fishes of the Indian Ocean. T.F.H. Publications, Neptune City, N.J. 240 p.

Allen, G.R. & R. Swainston, 1988. The marine fishes of north-western Australia. A field guide for anglers. Western Australian Museum, Perth. 201 p.

Amesbury, S.S. & R.F. Myers, 1982. Guide to the coastal fishes of Guam: Vol. 1. The fishes. University of Guam Press, Guam, 141 p.

Aoyama, T. & N. Sotogaki, 1955. On the development of the egg of *Nemipterus virgatus* (Houttuyn). Jap. J. Ichthyol., 4: 130-132.

Bauchot, M.-L. & G. Bianchi, 1984. Fiches FAO d'identification des espèces pour les besoins de la pêche. Guide des poissons commerciaux de Madagascar (espèces marines et d'eaux saumâtres). Avec le support du Programme des Nations Unies pour le Développement (Projet RAF/79/065). Rome, FAO, 135 p.

Bauchot, M.-L., Desoutter, M. & B.C. Russell, 1983. Catalogue critique des types de poissons du Muséum National d'Histoire naturelle - (Suite) (Famille des Nemipteridae). Bull. Mus. natn. Hist. nat., (4) 5: 3-25.

Bennett, E.T., 1832. Observations on a collection of fishes from The Mauritius, presented by Mr. Telfair with characters of new genera and species. Proc. Zool. Soc. Lond., (1831): 165-169.

Bianchi, G., 1985a. FAO species identification sheets for fishery purposes. Field guide to the commercial marine and brackish-water species of Tanzania. Prepared and published with the support of TCP/URT/4406 and FAO(FIRM) Regular Programme. Rome, FAO, 199 p.

_____, **1985b.** FAO species identification sheets for fishery purposes. Field guide to the commercial marine and brackish-water species of Pakistan. Prepared with the support of PAK/77/033 and FAO(FIRM) Regular Programme. Rome, FAO, 200 p.

Bleeker, P., 1845. Bijdragen tot de geneeskundige Topographie van Batavia. Gnerisch overzicht der Fauna. Nat. Geneesk. Arch. Ned. Indië, 2: 504-528.

Bleeker, P., 1848. A contribution to the knowledge of the ichthyological fauna of Sumbawa. J. Ind. Arch., 2: 632-639.

_____, **1851a.** Faunae ichthyologicae Javae Insularumque adjacentium Genera et species novae (1). Nat Tijdschr Ned-Indië, 1: 98-108.

_____, **1851b.** Nieuwe bijdrage tot de kennis der ichthyogische fauna van Celebes. Nat. Tijdschr. Ned.-Indië, **2**: 209-224.

_____, **1851c.** Nieuwe bijdrage tot de kennis der Percoidei, Scleroparei, Sciaenoidei, Maenoidei, Chaetodontoidei en Scombroidei van den Soenda - Molukschen Archipel. Nat. Tijdschr. Ned.-Indië, 2: 163-179.

_____, **1852a.** Bijdrage tot de kennis der ichthyologische fauna van het eiland Banka. Nat. Tijdschr. Ned.-Indië, 3: 443-460.

_____, **1852b.** Diagnostische beschrijvingen van nieuwe of weinig bekende vischsoorten van Sumatra. Tiental I-IV. Nat. Tijdschr. Ned.-Indië, 3: 569-608.

_____, **1852c.** Nieuwe bijdrage tot de kennis der ichthyologische fauna van het eiland Banka. Nat. Tijdschr. Ned.-Indië, 3: 715-738.

_____, **1852d.** Derde bijdrage tot de kennis der ichthyologische fauna van Celebes. Nat. Tijdschr. Ned.-Indië, 3: 739-782.

_____, **1853a.** Diagnostische beschrijvingen van nieuwe of weinig bekende vischsoorten van Sumatra. Tiental V-X. Nat. Tijdschr. Ned.-Indië, **4**: 243-302.

_____, **1853b.** Diagnostische beschrijvingen van nieuwe of weinig bekende vischsoorten van Batavia. Tiental I-VI. Nat. Tijdschr. Ned.-Indië, 4: 451-516.

_____, **1853c.** Bijdrage tot de kennis der ichthyologische fauna van Solor. Nat. Tijdschr. Ned.-Indië, **5**: 67-96.

_____, **1853d.** Nieuwe tientallen diagnostische beschrijvingen van nieuwe of weinig bekende vischsoarten van Sumatra. Nat. Tijdschr. Ned.-Indië, **5**: 495-534.

_____, **1854.** Vijfde bijdrage tot de kennis der ichthyologische fauna van Celebes. Nat. Tijdschr. Ned.-Indië, **7**: 225-260.

_____, **1855.** Zevende bijdrage tot de kennis der ichthyologische fauna van Celebes. Nat. Tijdschr. Ned.-Indië, **8**: 435-444.

_____, **1856-57.** Bijdrage tot der kennis der Ichthyologische fauna van het eiland Nias. Nat. Tijdschr. Ned.-Indië, **12**: 211-228.

_____, **1857.** Achtste bijdrage tot der kennis der vischfauna van Amboina. Act. Soc. Sc. Indo-Neerl., **2**:1-102.

_____, **1858-59.** Derde bijdrage tot de kennis der ichthyologische fauna van Bali. Nat. Tijdschr. Ned.-Indië, **17**: 141-175.

_____, **1859.** Derde bijdrage tot de kennis de vischfauna van Soembawa. Nat. Tijdschr. Ned.-Indië, **19**: 434-440.

Bleeker, P., 1860. Dertiende bijdrage tot de kennis ver vischfauna van Celebes. Visschen van Bonthain, Badjoa, Sindjai, Lagoesi en Pompenoea. Act. Soc. Sc. Indo-Neerl., **8**: 1-60.

_____, **1873.** Révision des èspeces de *Dentex*, *Synagris*, *Gymnocranius*, *Gnathodentex* et *Pentapus*. Verh. Akad. Amsterdam, **13**: 1-64.

Bloch, M.E., 1791. Naturgeschichte der auslandischen Fische, Part 5. J. Morino, Berlin, vi + 152 pp.

_____, **1792.** Naturgeschichte der Auslandischen Fische, Part 6. J. Morino, Berlin, iv + 126 pp.

_____, **1793.** Naturgeschichte der auslandischen Fische, Part 7. J. Morino, Berlin, x + 144 pp.

Bloch, M.E. & J.G. Schneider, 1801. Systema Ichthyologiae Iconibus CX Illustratum. Post Orbitum Auctoris Opus Inchoatum Absolvit, Correxit, Interpolavit Jo. Gottlob Schneider. Vol. 1. Jo. Gottlob Schneider, Berlin.

Bory de Saint-Vincent, G.-M., 1823. Dictionnaire Classique D'Histoire Naturelle. Vol.3. Paris, Rey et Gravier, Libraires-Editeurs, 592 pp.

Boulenger, G.A., 1901. On some deep-sea fishes collected by Mr F.W. Townsend in the sea of Oman. Ann. Mag. nat. Hist., (7) **7**: 261-263.

Cantor, T.E., 1850. Catalogue of Malayan Fishes. J.R. Asiat. Soc. Bengal, **18** (2) (1849): 983-1042.

Castelnau, F.L., 1875. Researches on fishes of Australia. Phil. Centen. Exhib. 1876 (Melbourne, 1875): Official Record. Intercol. Exhib. Essays, No. 2: 1-52.

Cuvier, G., 1815. Observations et recherches critiques sur différents poissons de la Méditerranée, et à leur occasion sur des poissons d'autres mers, plus ou moins liés avec eaux. Mém. Mus. Hist. Nat., Paris, **1**: 353-363.

_____, **1829.** Le Règne animal distribué d'après son organisation, pour servir de base à l'histoire naturelle des animaux et d'introduction à l'anatomie comparée. Vol 2. Paris.

Cuvier, G. & A. Valenciennes, 1830a. Histoire Naturelle des Poissons, Vol. 5. F.G. Levrault, Paris, 499 p.

_____, **1830b.** Histoire Naturelle des Poissons, Vol. 6 F.G. Levrault, Paris, 559 pp.

Dan, S.S., 1977. Intraovarian studies and fecundity in *Nemipterus japonicus* (Bloch). Indian J. Fish., 24: 48-55.

Day, F.W., 1865. On the fishes of Cochin, on the Malabar coast of India. Proc. Zool. Soc. Lond., 1865: 2-40.

Day, F., 1870. On the fishes of the Andaman Islands. Proc. Zool. Soc. Lond., 1870: 677-705.

Day, F., 1875-77. The fishes of India; being a natural history of the fishes known to inhabit the seas and freshwaters of India, Burma and Ceylon. Vol. 1. Bernard Quaritch, London, 320 + xii p, 133 pl.

De Vis, C.W., 1882. Descriptions of some new Queensland fishes. Proc. Linn. Soc. N.S.W., 7: 367-371.

_____, **1884.** New fishes in the Queensland Museum. Proc. Linn. Soc. N.S.W., 9: 389-400.

Duncker, G. & E. Mohr, 1931. Die Fische der Sudsee-Expedition der Hamburgischen Wissenschaftlichens stiftung 1908-1909. Tiel 3. Mitteil. Zool. Mus. Hamburg, 44: 57-84.

Eggleston, D., 1973. Patterns of biology in Nemipteridae. J. Mar. Biol. Assoc. India, (1972) 14: 357-364.

Evermann, B.W. & A Seale, 1907. Fishes of the Philippine Islands. Bull. Bur. Fish., 26 (1906): 51-110.

Fischer, W. & G. Bianchi (eds), 1984. FAO species identification sheets for fishery purposes. Western Indian Ocean; (Fishing Area 51). Prepared and printed with the support of the Danish International Development Agency (DANIDA). Vol. 3. Rome, FAO, 6 Vols: pag.var.

Fischer, W. & P.J.P. Whitehead (eds), 1974. FAO species identification sheets for fisheries purposes. Eastern Indian Ocean (fishing area 57) and Western Central Pacific (fishing area 71). Vol 3. FAO, Rome.

Forsskål, P., 1775. Descriptions animalium; avium, amphibiorum, piscium, insectorum, vermium, quae in itinere orientali observavit, Hauniae, 20 + xxxiv + 164 p.

Fourmanoir, P. & P. Laboute, 1976. Poissons des mers tropicales. Nouvelle Caledonie. Nouvelles Hebrides. Les Éditions du Pacifique, Paris. 376 p.

Fowler, H.W., 1904. A collection of fishes from Sumatra. J. Acad. Nat. Sci. Philadelphia, ser. 2, **12**: 495-560.

_____, **1931a.** Studies on Hong Kong Fishes. No. 2. Hong Kong Nat., 2: 287-317.

_____, **1931b.** Contributions to the biology of the Philippine Archipelago and adjacent regions. Bull. U.S. natn. Mus., (100) 11: 1-388.

_____, **1933.** Contributions to the biology of the Philippine Archipelago and adjacent regions. Bull. U.S. natn. Mus., (100) 12: 1-465.

_____, **1943.** Descriptions and figures of new fishes obtained in Philippine seas and adjacent waters by the United States Bureau of Fisheries Steamer "Albatross". Bull. U.S. natn. Mus., (100) 14: 53-91.

Gloerfelt-Tarp, T, & P.J. Kailola, 1984. Trawled fishes of southern Indonesia and northwestern Australia. Australian Development Assistance Bureau, Australia, Directorate General of Fisheries, Indonesia, German Agency for Technical Cooperation, Germany, xvi + 406 p.

Grant, E.M, 1982. Guide to fishes. Dept Harbours & Marine, Brisbane, 896 p.

Günther, A., 1859. Catalogue of the Acanthopterygian fishes in the collection of the British Museum, Vol. 1. British Museum, London, xxxi + 524 p.

_____, **1872.** On some new species of reptiles and fishes collected by J. Brenchley, Esq. Ann. Mag. Nat. Hist., (4) 10: 418-426.

Houttuyn, M., 1782. Beschrijving van eenige Japansche visschen en andere zeeschepselen. Verh. Holland. Maatsch. Wet. Haarlem, 20: 311-350.

Isa, M.B.Md, 1988. Population dynamics of *Nemipterus japonicus* (Pisces: Nemipteridae) off Kedah State, Malaysia. FAO Fish. Report 389: 126-140.

Isarankura, A.P., 1970. Synopsis of biological data on threadfin bream, *Nemipterus hexodon* (Quoy and Gaimard) 1824. pp 455-465 in The Kurushio: a symposium on the Japan Current. East-West Centre, Honolulu.

Ishikawa, C., 1904. Notes on some little known fishes of Japan. Proc. Dep. Nat. Hist. Tokyo Imp. Mus., 1: 1-17.

Johnson, G.D., 1980. The limits and relationships of the Lutjanidae and associated families. Bull. Scripps Inst. Oceanogr. Univ. Calif., 24: 1-114.

Jones, S. & M. Kumaran, 1980. Fishes of the Laccadive Archipelago. The Nature Conservation and Aquatic Sciences Service, Trivandrum, India. 760 p.

Jordan, D.S., 1917. The genera of fishes, from Linnaeus to Cuvier, 1758-1833, seventy-five years, with the accepted type of each. A contribution to the stability of scientific nomenclature. Stanford Univ. Publ., Univ. Ser., No. 27: 1-162.

Jordan, D.S. & B.W. Evermann, 1902. Notes on a collection of fishes from the island of Formosa. Proc. U.S. Natn. Mus., 25: 315-368.

Jordan, D.S. & R.E. Richardson, 1909. A catalogue of the fishes of the island of Formosa, or Taiwan, based on the collections of Dr. Hans Sauter. Mem. Carnegie Mus., 4: 159-204.

Jordan, D.S. & A. Seale, 1907. Fishes of the islands of Luzon and Panay. Bull. Bur. Fish., 26 (1906): 3-48.

Kamohara, T., 1938. On the offshore bottom-fishes of Prov. Tosa, Shikoku, Japan. 86 pp.

Kao, C.-L. & H.-C. Liu, 1979. Age and growth of golden thread, *Nemipterus virgatus* (Houttuyn), from the East and South China Seas. Acta Oceanogr. Taiwanica, (9): 97-109.

Kner, R., 1868. Uber neue Fische aus dem Museum der Herren Johann Casar Godeffroy and Sohnin Hamburg. Sitzber. Akad. Wien, 58: 26-34.

Krishnamoorthi, B., 1972. Biology of the threadfin bream *Nemipterus japonicus* (Bloch). Indian J. Fish., (1971) 18: 1-21.

Kuronuma, K. & Y. Abe, 1972. Fishes of Kuwait. Kuwait Institute for Scientific Research, Kuwait, xiv + 123 p.

_____, 1986. Fishes of the Arabian Gulf. Kuwait Institute for Scientific Research, Kuwait, xii + 356 p.

Kuthalingam, M.D.K., 1965. Notes on some aspects of the fishery and biology of *Nemipterus japonicus* (Bloch) with special reference to feeding behaviour. Indian J. Fish., 12: 500-506.

Kyushin, K. et al., 1977. Fishes of Indian Ocean. Japan Marine Fishery Resource Center, Tokyo, 392 p.

_____, 1982. Fishes of the South China Sea. Japan Marine Fishery Resource Center, Tokyo, 333 p.

Lacépède, B.G., 1802. Histoire naturelle des poissons, vol. 4. Plassen, Paris.

Lee, C.K.C., 1974. The exploitation of *Nemipterus japonicus* (Bloch) by Hong Kong vessels in 1972-73. Pacif. Sci. Assoc., Spec. Symp. Mar. Sci., 7-16 Dec. 1973, Hong Kong.: 48-52.

Lee, S.-C., 1986. Fishes of the family Nemipteridae (Teleostei: Percoidei) of Taiwan. Bull. Inst. Zool., Acad. Sinica, 25: 161-175.

Leis, J.M. & D.S. Rennis, 1983. The larvae of Indo-Pacific coral reef fishes. New South Wales University Press, Sydney and University of Hawaii Press, Honolulu, 269 p.

Li, K.-M., 1954. An account of the golden thread group fishery in Hong Kong, an a preliminary notes on the biology of *Nemipterus virgatus* (Houttyun). Hong Kong Univ. Fish. J., (1): 1-18.

Liu, H.-C. & M.-S Su, 1972. Maturity and spawning of golden thread (*Nemipterus virgatus*) from the northern area of the South China Sea. J. Fish. Soc. Taiwan, 1: 39-46.

Masuda, H., Araga, C. & T. Yoshino (eds), 1975. Coastal fishes of Southern Japan. Tokai Univ. Press, Tokyo, 379 p.

Masuda, H. et al. (eds), 1984. The fishes of the Japanese Archipelago. Tokai Univ. Press, Tokyo, xxii + 437 p.

Munro, I.S.R., 1955. The marine and freshwater fishes of Ceylon. Dept of External Affairs, Canberra, xvi + 351 p, 56 pl.

Murty, V.S., 1981. *Nemipterus mesoprion* (Bleeker 1853) (Nemipteridae Pisces) a new record from the seas around India. Indian J. Fish., (1978) 25: 207-213.

_____, 1984. Observations on the fisheries of threadfin breams (Nemipteridae) and on the biology of *Nemipterus japonicus* (Bloch) from Kakinada. Indian J. Fish., 31: 1-18.

Myers, R.F., 1989. Micronesian reef fishes; a practical guide to the identification of the inshore marine fishes of the tropical central and western Pacific. Coral Graphics, Barrigada, Guam. vi + 298 p, 144 pl.

Nzoika, R.M., 1985a. Some biological aspects of *Scolopsis ghanam* (Forskal) (Perciformes: Scolopsidae) in Zanzibar Channel. E. Afr. agric. For. J. (1983), 48: 69-73.

_____, **1985b.** Aspects of the biology of the reef fish *Scolopsis bimaculatus* (Ruppell) in Kenya I. Reproduction, feeding, and length-weight relationships. Kenya J. Sci. Technol., Ser. B, 6: 13-28.

Ogilby, J.D., 1910. On some new fishes from the Queensland coast. Endeavour Series (1): 85-139.

_____, **1916.** Three undescribed Queensland fishes. Proc. Roy. Soc. Qld, 28: 112-116.

_____, **1918.** Edible fishes of Queensland. Mem. Qld Mus., 6: 45-90.

Park, M., 1797. Descriptions of eight new fishes from Sumatra. Trans. Linn. Soc., 3: 33-38.

Pauly, D. & P. Martosubroto, 1980. The population dynamics of *Nemipterus marginatus* (Cuvier & Val.) off western Kalimantan, South China Sea. J. Fish. Biol., 17: 263-273.

Peters, 1877. Uebersicht der Wahrend der von 1874 bis 1876 unter dem Commandr des Hrn. Capitan 2. S. Freiherrn von Schleinitz ausgefuhrten Reise S.M.S. "Gazelle" gesammelten und vonder Kaiserlichen Admiralitat der kiniglichen Akademie der Wissenschaften Ubersandten Fische. Monatsber. Akad. Berlin, (1876): 831-854.

Playfair, R.L. & A. Günther, 1866. The Fishes of Zanzibar. John van Voorst, London.

Popta, C.M.L., 1918. Zweite Fortsetzung der Beschreibung von neuen Fisharten der Sunda - Expedition. Leiden, 8 pp.

_____, **1921.** Dritte fortsetzung der beschreibung von neuen fisharten der Sunda-expedition. Zool. Med. Rijksmus. Leiden, 6: 203-214.

Quoy, J.R.C. & J.P. Gaimard, 1824. Voyage autour du monde ... "Uranie" ... "Physicienne" ... Zoologie, poissons: 183-401.

Ramsay, E.P. & J.D. Ogilby, 1886. A contribution to the knowledge of the fish-fauna of New Guinea. Proc. Linn. Soc. N.S.W., (2) 1: 8-20.

Randall, J.E., Allen, G.R. & W.F. Smith-Vaniz, 1978. Illustrated identification guide to commercial fishes. Regional fishery survey and development project. Bahrain, Iran, Iraq, Kuwait, Oman, Qatar, Saudi Arabia, United Arab Emirates. Rome, FAO UNDP, FI:DP/RAB/71/278/3, 221 p.

Rao, D.M. & K.S. Rao, 1981. A revision of the genus *Scolopsis* Cuvier (Pisces: Nemipteridae) with descriptions of two new species from Indian waters. Proc. Konnkligke Ned. Akad. v. Wetensch, 84 (1): 131-141.

Rau, N. & A. Rau, 1980. Commercial fishes of the Philippines. German Agency for Technical Cooperation, Eshborn, 623 p.

Renzhai, Z., 1986. On the larvae morphology of *Nemipterus virgatus* (Houttuyn) with reference to their spawning ground and season in the northern South China Sea. Mar. Fish. Res., 7: 15-162.

Renzhai, Z. & L. Suifen, 1980. On the eggs and larvae of the golden-thread *Nemipterus virgatus* (Houttuyn). Acta Zool. Sinica, 26: 136-139.

Richardson, J., 1842. Contributions to the ichthyology of Australia. Ann. Mag. Nat. Hist., 9: 384-393.

_____, **1843a.** Contributions to the ichthyology of Australia. Ann. Mag. Nat. Hist., 11: 352-359.

_____, **1843b.** Icones Piscium. London, Richard and John E. Taylor. 8 pp + 5 pl.

_____, **1846.** Report on the ichthyology of the seas of China and Japan. Rpt. Brit. Assoc. Advt Sci., (1845) 15: 187-320.

Rüppell, E., 1828-31. Atlas zu der Reise im nordlichen Afrika. Fische des Rothen Meers. Bonner, Frankfurt-a-main.

Russell, B.C., 1986a. Review of the western Indian Ocean species of *Nemipterus* Swainson 1839, with description of a new species. Senckenbergiana Biol., **67**: 19-35.

_____, **1986b.** Two new species of *Parascolopsis* (Pisces: Nemipteridae) from north-western Australia, Indonesia and the Philippines. Beagle, Occ. pap. Nor. Terr. Mus. Arts Sci., 3: 137-142.

_____, **1990.** A new species of *Nemipterus* from the south-western Pacific. Beagle, Rec. Nor. Terr. Mus. Arts Sci., 7: 35-38.

Russell, B.C., Allen, G.R. & H.R. Lubbock, 1976. New cases of mimicry in marine fishes. J. Zool. Soc., Lond., **180**: 407-423.

Russell, B.C. & T. Gloerfelt-Tarp, 1984. A new species of *Parascolopsis* (Pisces: Nemipteridae) from Indonesia. Beagle, Occ. pap. Nor. Terr. Mus. Arts Sci., 1: 111-114.

Russell, P., 1803. Descriptions and figures of two hundred fishes; collected at Vizagapatam on the coast of Coromandel. Vol. 2. G. & W. Nicol, Pall-Mall.

Said, M.Z.M., Ambak, M.A. & A.K.M. Mohsin, 1983. Some aspects of the fishery and biology of *Nemipterus tolu* C.V. off the Trengganu coast, South China Sea. Pertanika, 6: 108-111.

Sainsbury, K.J., Kailola, P.J. & G.G. Leyland, 1984. Continental shelf fishes of northern and north-western Australia. Clouston & Hall & Peter Pownall Fisheries Information Service, Canberra, viii + 375 p.

Sainsbury, K.J. & A.W. Whitelaw, 1984. Biology of Peron's threadfin bream, *Nemipterus peronii* (Valenciennes), from the North West Shelf of Australia. Aust. J. Mar. Freshw. Res., 35: 167-185.

Saville-Kent, W., 1893. The Great Barrier Reef of Australia; its products and potentialities. W.H. Allen & Co., Ltd, London, xvii + 387 p, 48 pl, 16 col. pl.

Schroeder, R.E., 1980. Philippine shore fishes of the Western Sulu Sea. National Media Production Center, Manila, xv + 266 p.

Scott, T.D., 1959. Notes on Western Australian fishes, No.1. Trans. Roy. Soc. S. Aust., 82: 73-91.

Seale, A., 1909. New species of Philippine fishes. Philip. J. Sci., A, 4: 491-541.

Senta, T. & K.-S. Tan, 1975. Species and size-composition of threadfin snappers in the South China Sea and Andaman Sea. Singapore J. Pri. Ind., 3 (1): 1-11.

Shen, S.-C. (ed.), 1984. Coastal fishes of Taiwan. S.-C. Shen, Taipei, 190 p.

Shao, K.-T. & J.-P. Chen, 1988. Twelve new records of fishes from Taiwan. J. Taiwan Mus., 41: 113-125.

Smith, J.L.B., 1939. New records and descriptions of marine fishes from Portuguese East Africa. Trans Roy. Soc. S. Africa, 27: 215-222.

_____, **1941.** The genus *Gymnocranius* Klunzinger, with notes on certain rare fishes from Portuguese East Africa. Trans. Roy. Soc. S. Africa, 28: 441-452.

Smith, J.L.B. & M.M. Smith, 1963. The fishes of Seychelles. J.L.B. Smith Institute of Ichthyology, Grahamstown. 223 p.

Smith, M.M. & P.C. Heemstra (eds), 1986. Smith's sea fishes. Macmillan South Africa, Johannesburg. xx + 1047 p.

Smith-Vaniz, W.F., 1976. The sabre-toothed blennies, tribe Nemophini (Pisces: Blenniidae). Acad. Nat. Sci. Philadelphia, Monogr., 19: 1-196.

Snyder, J.O., 1911. Descriptions of new genera and species of fishes from Japan and the Riu Kiu Islands. Proc. U.S. natn. Mus., **40**:525-549.

Steindachner, F., 1864. Ichthyologische Notizen. Sitz. Ber. Akad. Wiss. Wien. math-nat. Kl., 49: 200-214.

_____, **1866.** Ichthyologische Mittheilungen (IX). Verh. zool. bot. Ges. Wien, 16: 761-796.

_____, **1868.** Ichthyologische Notizen (VII). Sitz. Ber. Akad. Wiss. Wien. math-nat. Kl., 57: 965-1008.

Stokes, J.L., 1846. Discoveries in Australia ... H.M.S. Beagle. Boone, London, Vol. 1, appendix.

Swainson, W., 1839. The natural history and classification of fishes, amphibians and reptiles, or monocardian animals. Vol. 2. Fishes. London.

Takahashi, H., Kobayashi, K. & K. Suzuki, 1989. Gonadal morphology of threadfin breams, *Nemipterus bathybius* and *N. virgatus*: evidence of rudimentary hermaphroditism. Jap. J. Ichthyol., 36: 82-89.

Talwar, P.K., 1986. On a new bathypelagic fish, *Parascolopsis jonesi* (Pisces: Nemipteridae) from The Arabian Sea. pp 1-6 in Recent Advances in Marine Biology (P.S.B.R. James ed.) Today and Tomorrow's Printers and Publishers, New Delhi.

Tan, S.M. et al., 1982. A colour guide to the fishes of the South China Sea and the Andaman Sea. Primary Production Dept, Marine Fisheries Research Dept, SEAFDEC, Singapore, 45 p + vi.

Tanaka, S., 1915. Figures and descriptions of Japan. Tokyo 19-21. pp 319-382 15 pl.

Temminck, J.C. & H. Schlegel, 1843. Pisces in P. Siebold, Fauna Japonica. Leyde, 324 p.

Thiollière, V.J., 1857. Partie ichthyologique de la fauna de l'île de Woodlark on Moiou (Mélanésie). Lyon, 1856.

Vivekananden, E. & D.B. James, 1986. Population dynamics of *Nemipterus japonicus* (Bloch) in the trawling grounds off Madras. Indian J. Fish., 33: 145-154.

Weber, M., 1913. Die Fische der Siboga Expedition. Siboga Exped., 57: 710 pp.

Weber, M. & L.F. de Beaufort, 1936. The fishes of the Indo-Australian Archipelago, Vol. 7. E.J. Brill Ltd., Leiden, 607 p.

Weber, W. & A.A. Jothy, 1977. Observations on the fish *Nemipterus* spp. (Family: Nemipteridae) in the coastal waters of East Malaysia. Arch. Fisch. Wiss., 28: 109-122.

Whitley, G.P., 1937. Further ichthyological miscellanea. Mem. Qld. Mus., 11: 113-148.

_____, 1947. New sharks and fishes from Western Australia. Part 3. Aust. zool., 11: 129-150.

Wongratana, T., 1972. Identification of *Nemipterus* in Thailand. Proc. 2nd CSK Symp., Tokyo, 1970: 465-487.

_____, 1974. *Nemipterus* spp in Thailand. Proc. 3rd CSK Symp., Bangkok, 1972, 347-430.

_____, 1978. A key for the identification of *Scolopsis* from Thailand (Pisces: Nemipteridae). Nat. Hist. Bull. Siam Soc., 27: 23-24.

Young, P.C. & R.B. Martin, 1985. Sex ratios and hermaphroditism in nemipterid fish from northern Australia. J. Fish. Biol., 26: 273-287.

6. INDEX OF SCIENTIFIC AND VERNACULAR NAMES

EXPLANATION OF THE SYSTEM

The index applies exclusively to the genera and species accounts (Section 2.4 Information by Species)

Type faces used :

Italics (bold) : Valid scientific names (double entry by genera and species)

Italics : Synonyms (double entry by genera and species)

Roman (bold) : International (FAO) species names

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7. COLOUR PLATES

PLATE I

a) *Nemipterus balinensis*
b) *Nemipterus balinensoides*
c) *Nemipterus bathybius*
d) *Nemipterus bipunctatus*
e) *Nemipterus celebicus*
f) *Nemipterus furcosus*
g) *Nemipterus gracilis*
h) *Nemipterus hexodon*

PLATE II

a) *Nemipterus isacanthus*
b) *Nemipterus japonicus*
c) *Nemipterus marginatus*
d) *Nemipterus mesoprion*
e) *Nemipterus nematophorus*
f) *Nemipterus nematopus*
g) *Nemipterus nemurus*
h) *Nemipterus peronii*

PLATE III

a) *Nemipterus randalli*
b) *Nemipterus* sp. 1
c) *Nemipterus* sp. 2
d) *Nemipterus* sp. 3
e) *Nemipterus tambuloides*
f) *Nemipterus theodorei*
g) *Nemipterus virgatus*
h) *Nemipterus vitiensis*

PLATE IV

a) *Nemipterus zysron*
b) *Parascolopsis aspinosa*
c) *Parascolopsis eriomma*
d) *Parascolopsis inermis*
e) *Parascolopsis qantasi*
f) *Parascolopsis rufomaculatus*
g) *Parascolopsis tanyactis*
h) *Parascolopsis tosensis*

PLATE V

a) *Pentapodus bifasciatus*
b) *Pentapodus caninus*
c) *Pentapodus emeryii*
d) *Pentapodus nagasakiensis*
e) *Pentapodus paradiseus*
f) *Pentapodus porosus*
g) *Pentapodus setosus*
h) *Pentapodus* sp.

PLATE VI

a) *Pentapodus trivittatus*
b) *Pentapodus vitta*
c) *Scaevius milii*, juvenile
d) *Scolopsis affinis*
e) *Scolopsis auratus*
f) *Scolopsis bilineatus*
g) *Scolopsis bilineatus*, juvenile
h) *Scolopsis bilineatus*, juvenile

PLATE VII

a) *Scolopsis bimaculatus*
b) *Scolopsis ciliatus*
c) *Scolopsis frenatus*
d) *Scolopsis frenatus*, juvenile
e) *Scolopsis ghanam*
f) *Scolopsis lineatus*
g) *Scolopsis lineatus*, juvenile
h) *Scolopsis margaritifer*

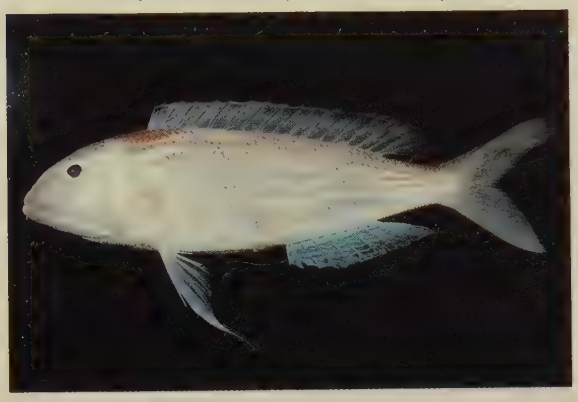
PLATE VIII

a) *Scolopsis margaritifer*, juvenile
b) *Scolopsis monogramma*
c) *Scolopsis taeniatus*
d) *Scolopsis taeniopterus*
e) *Scolopsis temporalis*
f) *Scolopsis trilineatus*
g) *Scolopsis vosmeri*
h) *Scolopsis xenochrous*

a) *Nemipterus balinensis*
Bali, Indonesia (B.C. Russell)

b) *Nemipterus balinensoides*
Bali, Indonesia (B.C. Russell)

c) *Nemipterus bathybius*
(D. Eggleston)



d) *Nemipterus bipunctatus*
Tuticorin, India (J.E. Randall)

e) *Nemipterus celebicus*
Arafura Sea (B.C. Russell)

f) *Nemipterus furcosus*
Ambon, Indonesia (J.E. Randall)

g) *Nemipterus gracilis*
Lombok, Indonesia (B.C. Russell)

h) *Nemipterus hexodon*
Ambon, Indonesia (J.E. Randall)

a) *Nemipterus isacanthus*
Northwest Australia (CSIRO)

b) *Nemipterus japonicus*
Cochin, India (J.E. Randall)

c) *Nemipterus marginatus*
Northwest Australia (CSIRO)

d) *Nemipterus mesoprion*
Lombok, Indonesia (J.E. Randall)

e) *Nemipterus nematophorus*
(D. Eggleston)

f) *Nemipterus nematopus*
Northwest Australia (CSIRO)

g) *Nemipterus nemurus*
Lombok, Indonesia (J.E. Randall)

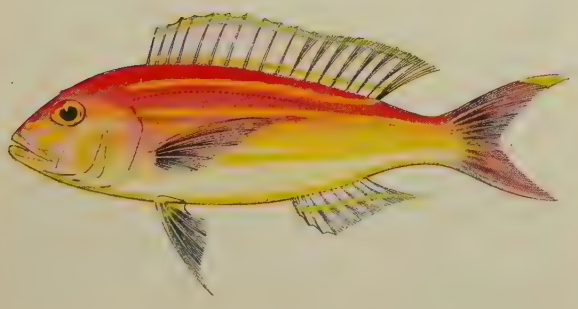
h) *Nemipterus peronii*
Vizhingham, India (J.E. Randall)

a) *Nemipterus randalli*
Bahrain (J.E. Randall)

b) *Nemipterus* sp. 1
Lombok, Indonesia (B.C. Russell)

c) *Nemipterus* sp. 2
(D. Eggleston)

d) *Nemipterus* sp. 3
Lombok, Indonesia (B.C. Russell)



e) *Nemipterus tambuloides*
(D. Eggleston)

f) *Nemipterus theodorei*
Lady Musgrave lagoon (D. Tuma)

g) *Nemipterus virgatus*
(D. Eggleston)

h) *Nemipterus vitiensis*
Fiji (A. Lewis)

a) *Nemipterus zysron*
Negros, Philippines (J.E. Randall)

b) *Parascolopsis aspinosa*
Bahrain (J.E. Randall)

c) *Parascolopsis eriomma*
Okinawa, Japan (J.E. Randall)

d) *Parascolopsis inermis*
Okinawa, Japan (J.E. Randall)

e) *Parascolopsis qantasi*
Sumatra, Indonesia (T. Gloerfelt-Tarp)

f) *Parascolopsis rufomaculatus*
Northwest Australia (CSIRO)

g) *Parascolopsis tanyactis*
Northwest Australia (CSIRO)

h) *Parascolopsis tosensis*
Lombok, Indonesia (B.C. Russell)

a) *Pentapodus bifasciatus*
Singapore (J.E. Randall)

b) *Pentapodus caninus*
Tulai, Pulau, Malaysia (J.E. Randall)

c) *Pentapodus emeryii*
Lombok, Indonesia (J.E. Randall)

d) *Pentapodus nagasakiensis*
Shirahama, Japan (J.E. Randall)

e) *Pentapodus paradiseus*
Queensland, Australia (J.E. Randall)

f) *Pentapodus porosus*
Northwest Australia (CSIRO)

g) *Pentapodus setosus*
Singapore (J.E. Randall)

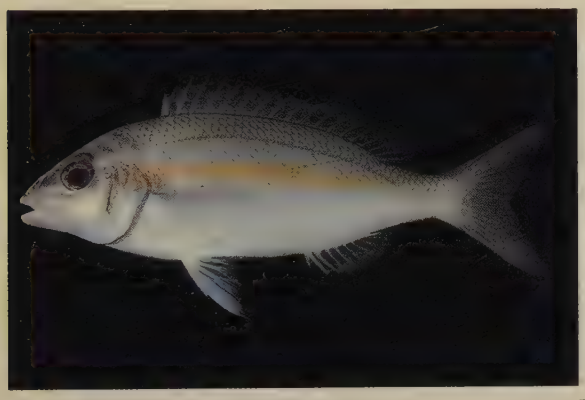
h) *Pentapodus* sp.
New Caledonia (J.E. Randall)

a) *Pentapodus trivittatus*
Papua, New Guinea (J.E. Randall)

b) *Pentapodus vitta*
Western Australia (G.R. Allen)

c) *Scaevius milii*
Northern Territory, Australia (J.E. Randall)

d) *Scolopsis affinis*
Queensland, Australia (J.E. Randall)



e) *Scolopsis auratus*
Maldives (J.E. Randall)

f) *Scolopsis bilineatus*
Palau (J.E. Randall)

g) *Scolopsis bilineatus*, juvenile
Queensland, Australia (G.R. Allen)

h) *Scolopsis bilineatus*, juvenile
Fiji (G.R. Allen)

a) *Scolopsis bimaculatus*
Vizhingham, India (J.E. Randall)

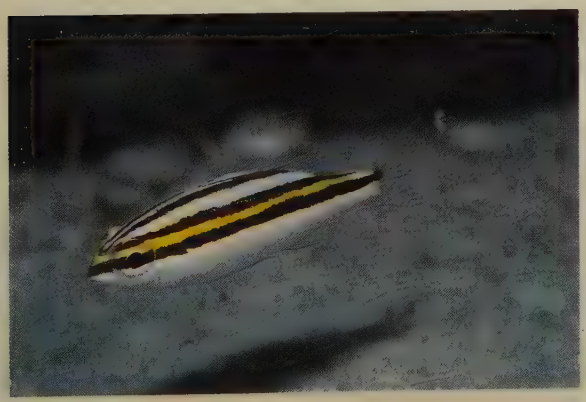
b) *Scolopsis ciliatus*
Papua New Guinea (J.E. Randall)

c) *Scolopsis frenatus*
Seychelles (J.E. Randall)

d) *Scolopsis frenatus*, juvenile
Seychelles (R. Steene)

e) *Scolopsis ghanam*
Red Sea (J.E. Randall)

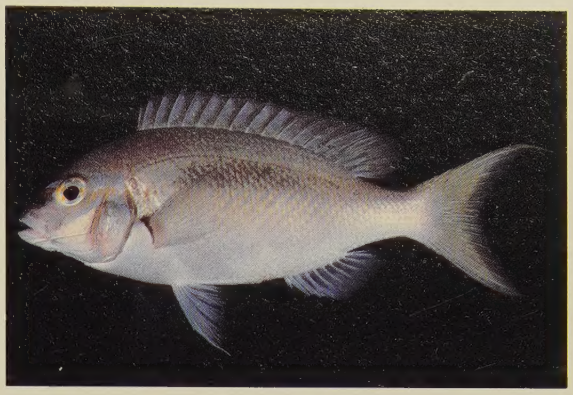
f) *Scolopsis lineatus*
Guam (J.E. Randall)



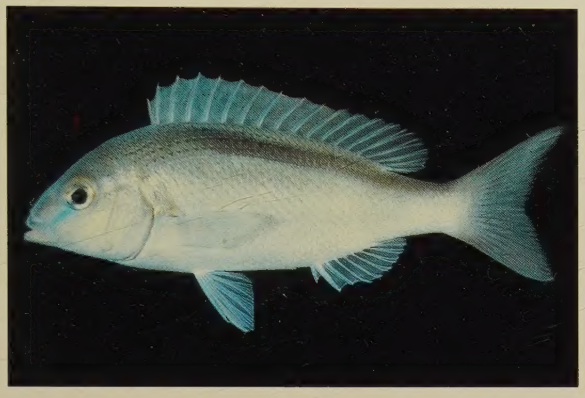
g) *Scolopsis lineatus*, juvenile
Queensland, Australia (R. Steene)

h) *Scolopsis margaritifer*
Solomon Is. (J.E. Randall)

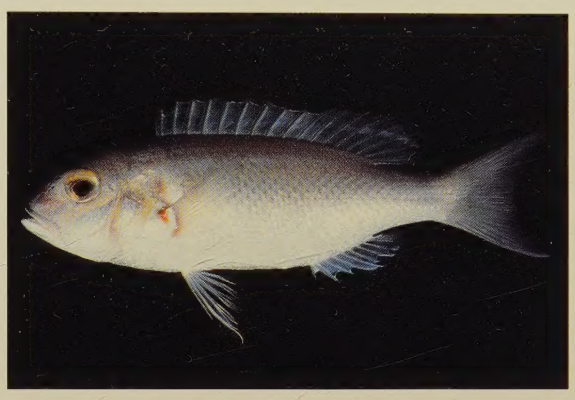
a) *Scolopsis margaritifer*, juvenile
Flores, Indonesia (J.E. Randall)



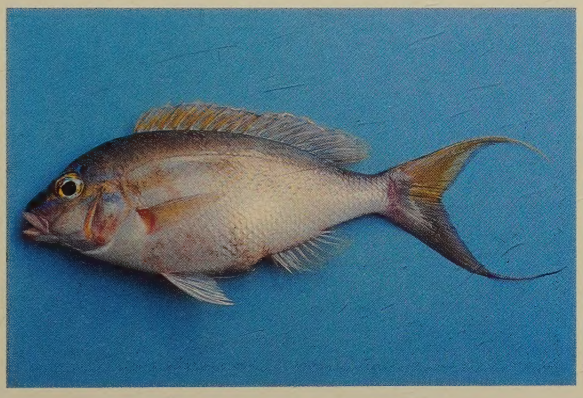
b) *Scolopsis monogramma*
Ambon, Indonesia (J.E. Randall)



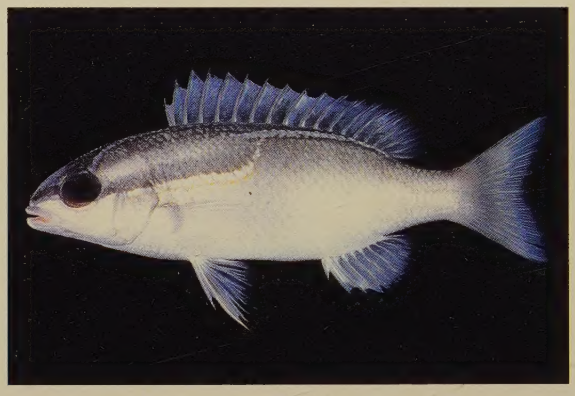
c) *Scolopsis taeniatus*
Bahrain (J.E. Randall)



d) *Scolopsis taeniopterus*
Cebu, Philippines (J.E. Randall)



e) *Scolopsis temporalis*
Flores, Indonesia (B.C. Russell)



f) *Scolopsis trilineatus*
Tonga (J.E. Randall)

g) *Scolopsis vosmeri*
Sri Lanka (J.E. Randall)

h) *Scolopsis xenochrous*
Ambon, Indonesia (J.E. Randall)

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